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KOOTENAI DEVELOPMENT IMPOUNDMENT DAM
JANUARY 2011 ROUTINE OWNERS INSPECTION

Prepared for: The Remedium Group

Prepared by: Kurt Hafferman, P.E.

BILLMAYER & HAFFERMAN INC.
2191 3rd Avenue East
Kalispell, Montana 59901

Inspection Date: February 04th, 2011
Report Date: February 07th, 2011

INSPECTION DATE: **February 04th, 2011**
REFERENCE: **JANUARY 2011 ROUTINE OWNERS INSPECTION**

OBJECTIVES

The end of January 2011 routine owner's inspection was conducted on Friday February 04th, 2011. Personnel included Kurt Hafferman, P.E. and Dan Nelson from BHI and Brandon Chapman and Jeremy Peterson from Chapman Construction.

The inspection was conducted as a routine owner's inspection. Project tasks to be completed included:

1. Safety meeting with Chapman and BHI
2. Check Upper Rainy Creek inflows
3. Read reservoir level
4. Record Piezometer readings including a manometer reading on piezometer P0
5. Inspect the embankment dam
6. Inspect principal spillway
7. Inspect outside and inside of drains
8. Read flumes and weirs below the drain outlets.
9. Replace LRC-01 gauge to reflect flow changes from flume repairs
10. Read staff gauges in all streams above and below drain outlet channel.
11. Decontaminate and depart site

RESULTS

BHI met with Chapman Construction at 9:55 a.m. and the routine owner's inspection began at 10:15 a.m. and ran until 1:15 p.m. The weather was cloudy and calm with light to moderate snow/rain during the inspection. The temperature ranged between 29° and 35°. There is about 8" of snow on the ground and travel and walking was hazardous. There were no weather or equipment impediments that affected the inspection. Copies of photographs from the date of the inspection are included in Appendix 1.

Copies of the Routine Owners Inspection Report as filled out after the inspection and copies of the field notes are provided in Appendix 2. The following are the results of each of the eleven (11) tasks above;

1. Safety Meeting: Jeremy Peterson is assigned as the health and safety officer and is responsible for equipment condition, decontamination procedures and over-all KDID site safety. The safety meeting with Chapman Construction's Jeremy and Brandon included discussion of the work tasks and procedures for the day, snowmobile and 4-wheeler safety, adequate clothing and over heating issues and concerns and overall job site safety. Equipment was checked and no issues were found and all personnel were equipped and prepared for the cold and snow conditions. Standard equipment used included: warm weather gear under double Tyvek suits, rubber booties, double vinyl gloves and North® full face mask. Booties were taped at the top and Tyvek suits are taped at the zipper on the outer suit.
2. The Upper Rainy Creek flume was read.

- a. Due to snow levels above URC-02 The Fleetwood Creek Flume was not monitored.
 - b. The flow in Upper Rainy Creek has increased. The URC-02 Flume was read and the gauge height was recorded at 0.38 feet.
3. The reservoir level was below the gauge. The level is estimated to be -0.30 ft., the reservoir is frozen and Snow Covered and no water was visible.
4. All piezometers were read and no anomalies were noted. Another attempt was made to get a manometer reading on piezometer PO. After review of an aerial photo, the piezometer was located in the field. Modifications were made to the two (2) tubes that are in the piezometer by cutting broken sections off. However, due to apparent leaks in the lines further down in the line, a reading could not be attained. The field note readings from the other piezometers are provided in Appendix 2 and an update of the piezometer plots is included in Appendix 3.
5. No bulges, erosion or other anomalies or changes were noted on the embankment from the upstream face to the toe.
6. No water has run in the Spillway, no changes have been noted or observed and the trash rack is clean.
7. Drains were inspected and the flows in the drains and stream channel below the drains were recorded. Generally drain flows increased with the exception of drains 7 and 8 with the Flume 7-8 gauge showing a slight decrease over last months reading. Seepage was noted below Drain 7, but no more than has typically been seen. It was noted that water was visibly flowing in drain 2, something that has never been witnessed during a BHI inspection this time of the year. After review of December inspection photos, it was found that water could be seen inside the drain but not visibly flowing due to snow levels. A graduated cylinder was used to check for sedimentation in the water at each drain; none was noted. Drain flows were all clear and steady.
8. All weirs and drains were read, no anomalies were found. Results are shown in Table 1 below.
9. The Marsh McBirney flow meter was used to get an accurate reading of water below the LRC-01 flume. The flow was calculated in gpm and the new gauge for the LRC-01 flume was installed to match the current reading. The initial reading was 0.20 ft. at a flow of 364 gpm.
10. Gauge height readings from the flumes and weirs instream and below the toe drains were taken. Results are shown in Table 1 below.
11. Initial Personnel decontamination was conducted at the contamination reduction site by inspection and brushing the snowmobiles and 4x4. As snowmobiles and the 4-wheeler were used for access and due to snowy conditions, equipment could not be pressure washed. Final removal of the inner Tyvek suit and removing the mask, took place at the support trailer.

The readings from all of the inflow and outflow streams, including the flumes, weirs and reservoir levels are shown in Table 1 below. Table 2 shows the net difference between inflows and outflows on the day of the inspection.

Table 1: Flow Measurement Results

Station	GH Reading (ft.) GH Reading last Month	GH Reading (ft.) GH Reading this Month	GH Reading Difference from last month.	Flow (gpm)/VOL (AF) last Month	Flow (gpm)/VOL (AF) This Month	Flow/VOL Difference from last month.	Temp °F
URC02	0.35	0.38	+0.03	111.3 gpm	130.6 gpm	+19.3 gpm	
Fleetwood Creek	Frozen	N/R		Frozen			
Reservoir	B/G	B/G		B/G			
F 1-2-3-4	0.12	0.14	+0.02	9.47 gpm	12.7 gpm	+3.23 gpm	47°F
W 5	0.01	0.04	+0.03	0.01 gpm	0.38 gpm	+0.37 gpm	47°F
D6	0.958	0.916	+0.042	87.9 gpm	154.64 gpm	+66.74 gpm	47°F
F 7-8	0.13	0.12	-0.01	7.76 gpm	6.55 gpm	-1.21 gpm	47°F
W 12	0.167	0.208	+0.041	13.20 gpm	22.75 gpm	+9.55 gpm	50°F
F -Seep	0.10	Leak		11.13 gpm			
LRC01	0.70	0.20*	+0.03	345 gpm	364 gpm	+19 gpm	47°F
CC02	0.31	Frozen		229.60 gpm			
LRC02	0.40	0.45	+0.05	428 gpm	514 gpm	+86 gpm	36°F
LRC06	0.51	Frozen		624 gpm			

N/R – Not Read due to access

B/G – Below Gauge

*Gauge Replaced to match flume repairs

Table 2: Total Flows

Total Flows	
Inflows Above Reservoir at URC02	130.6 gpm
Outflow Below Reservoir above CC02	514 gpm*
Difference	+383.4 gpm*

* CC-02 Flume was frozen and flows could not be subtracted from Rainy Creek Flows.

DISCUSSION

Site Access

Access to the site was obtained with the 4-wheeler along with 2 snowmobiles. Jeremy Peterson is the onsite health and safety, equipment and personnel safety officer. Kurt expressed to the crew due to continued winter conditions all were reminded to not physically exert themselves in deep snow, to use vehicles to travel as much as possible and to use the buddy system on all tasks. Other than accessing the Fleetwood Creek flume, a full inspection was accomplished.

Surface Water Flows

In general inflows, reservoir levels, drain outflows and lower Rainy Creek flows are still increasing from measurements in December 2010. The inflows from Upper Rainy Creek have increased from 111.3 gpm to 130.6 gpm, an increase of 19.3 gpm or 14.8% from the December inspection. The weather has been somewhat colder with temperatures as low as 3°F (Below 0°F with wind chill) but have been as high as 46°F since the last inspection. There has been 4.9 inches of precipitation since the December inspection. There has been some low elevation ice jam flooding in Libby

so there has been a warming trend that has kept stream flows rising. Typically, December and January are the lowest flow months.

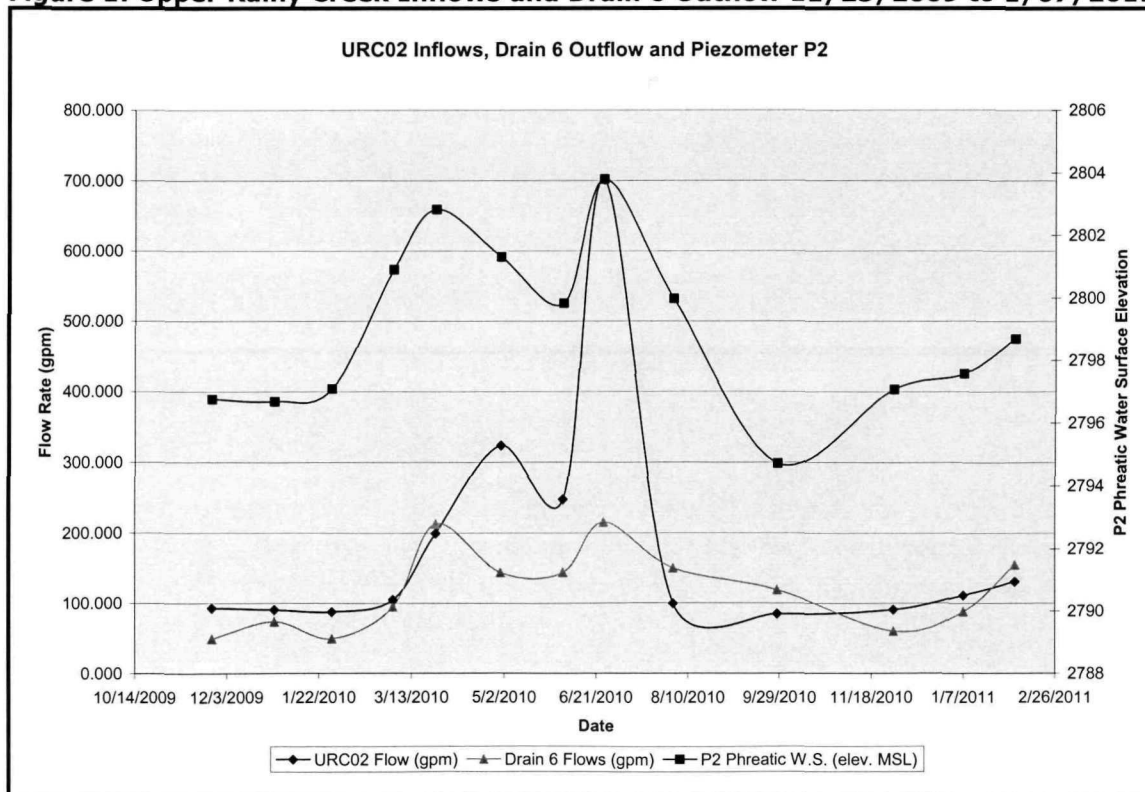
The precipitation in this area as of February 04, 2011 is reported as 65% of normal at Banfield Mountain site which is just northwest of the project, so the water year beginning October 1, 2010 in the project area is dryer than normal so far. We would note that the overall Kootenai basin is at 106% of normal. The overall lack of precipitation at the project site is shown in the low reservoir levels visually observed at the site. Snow depth was notably reduced from the rain-on-snow and warm temperatures. Outflows have increased and are now greater than inflows by 383 gpm. All surface water flows are noted as being clear and steady.

Drain Flows

Drain 6, the main drain at the toe, again increased flow. The increase was from 87.9 gpm to 154.64 gpm, an increase of 66.74 gpm, or 43.1% since December measurements. The steady increase in flows follows lower than expected flows during the November 2010 and increased flows in the December 2010 inspection. The drain flows recorded are slightly higher than the same time last year, which correlates with the increase in precipitation so far this year. A graph of the Rainy Creek inflows and drain 6 outflows from November 25th of 2009 to this inspection is shown in Figure 1 below.

Although it is not unusual to have an increase of inflows and a rise in Piezometers, it was still unusual for this time of year. As of this inspection, drain flows have increased and are now greater than recorded inflows.

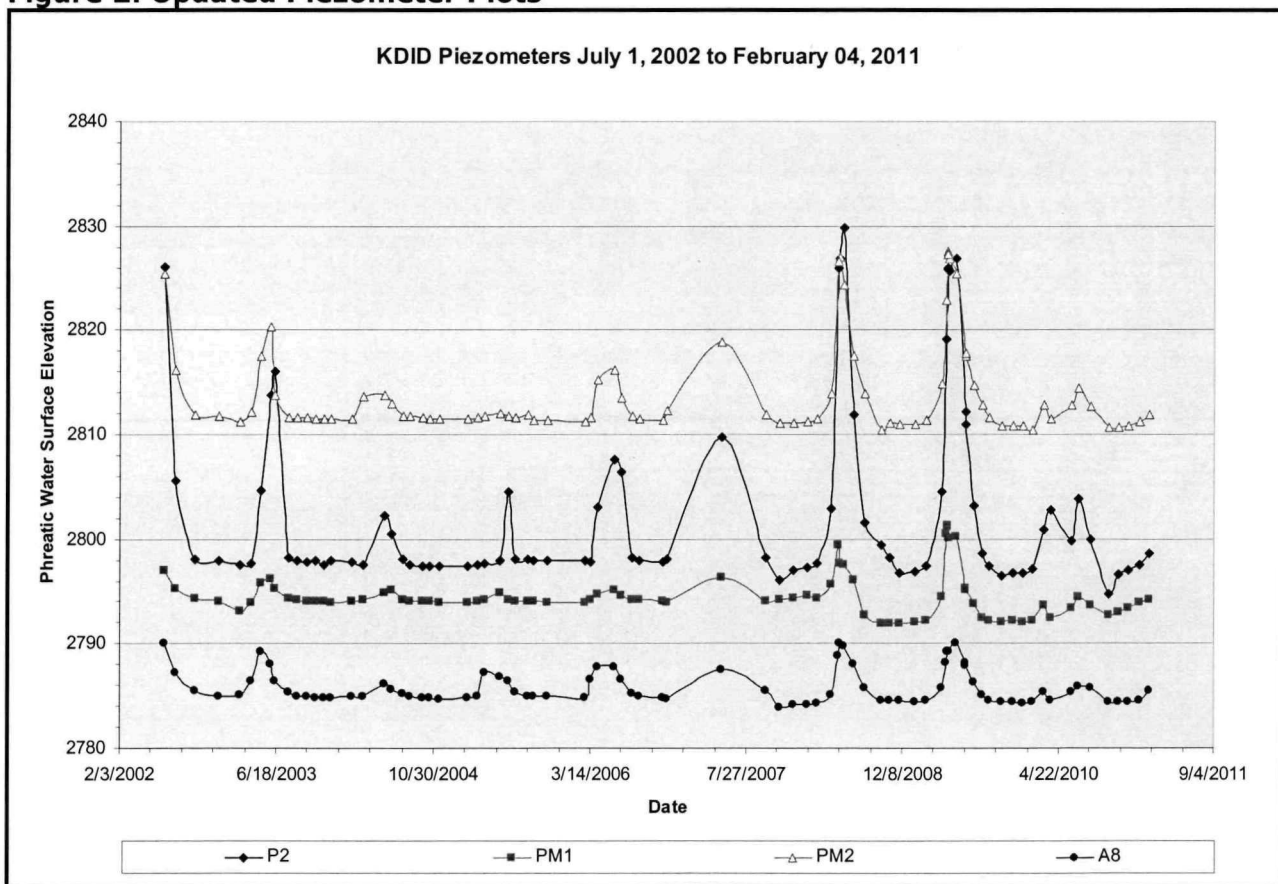
Figure 1: Upper Rainy Creek Inflows and Drain 6 Outflow 11/25/2009 to 1/07/2011



Piezometers

The updated piezometer data is shown in Figure 2 below. It was noted that piezometer readings were lower in the November inspection than in this inspection as can be seen in Figure 2 below. This is unusual as we typically have declining inflows and piezometer readings until late February in most years we have recorded data (since 2007). It is assumed that the warmer temperatures and increased precipitation this year has resulted in at least one major rain on snow event that melted approximately 50% of the snow on the site since the last inspection. It appears that these events have shown up as inflows and have routed through the reservoir and embankment and are now present as higher piezometer readings. As stated above, we have recorded outflows that are now greater than inflows so we anticipate stabilized and falling inflow, piezometer and outflow readings next month as long as temperatures and precipitation return to more normal levels.

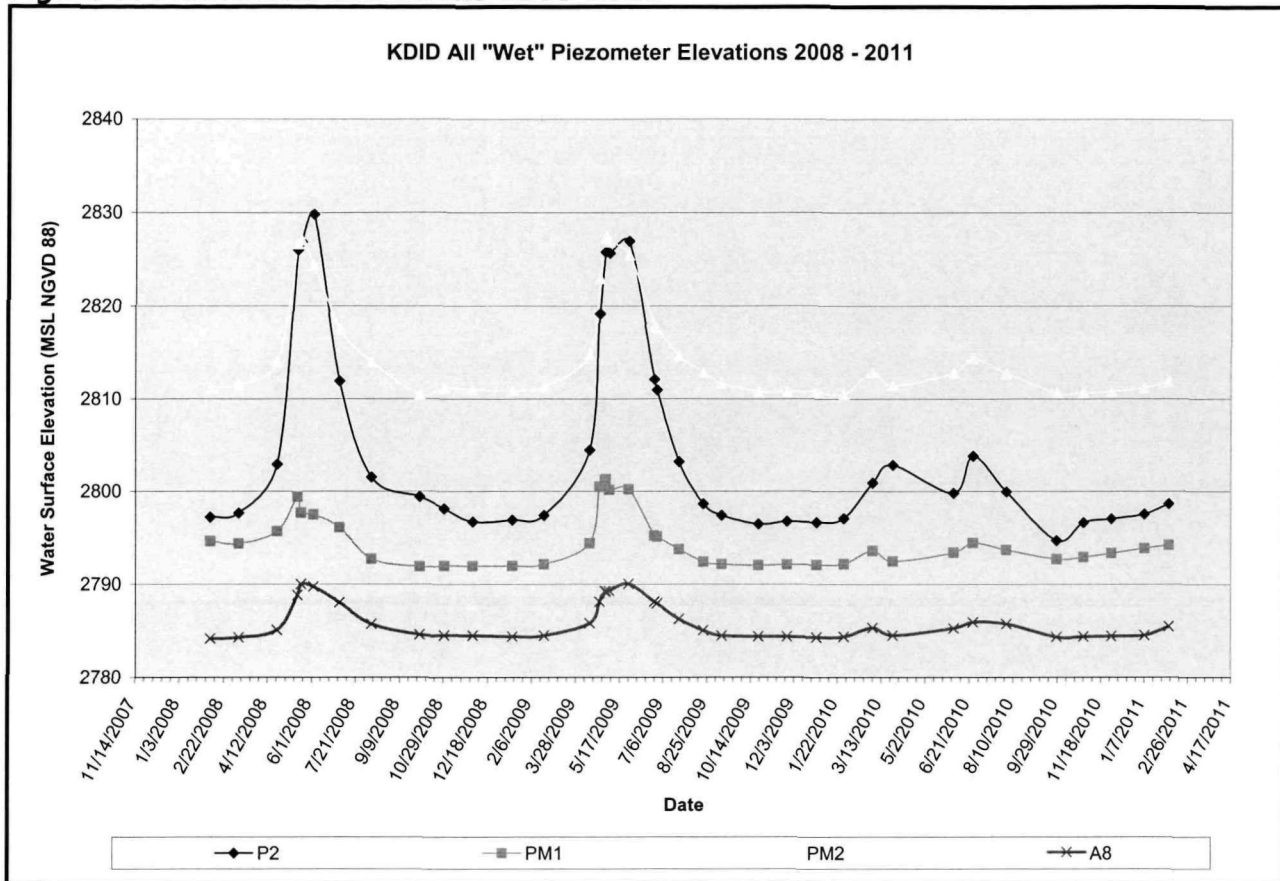
Figure 2: Updated Piezometer Plots



These graphs show that the phreatic water surface has risen in the piezometers to similar to 2006. As BHI did not begin inspections until 2007, we have never seen these levels onsite at this time of year.

A second graph of the piezometers in Figure 3 below is a graph of the same piezometers as in Figure 2 above over a shorter period of time. The graph below represents the piezometer data collected since BHI began inspections onsite.

Figure 3: Piezometer Elevations 2008-2011



The graph above again shows a continued rise in piezometers P2, PM1 and PM2 as discussed above which also does not show up as more pronounced in other years. The only anomaly is that we typically see a steady decline from late October through late February. This is, again, likely contributed to higher snowpack levels than we have seen since BHI began inspections.

An important note to this discussion is the flow seen from Drain 2 during this inspection. BHI has never seen water in Drain 2 during a winter inspection. Until further analysis can prove otherwise, we attribute this flow to the construction repairs made to the drain last year. The old drain had a large hole in the pipe and a portion of the pipe has now been replaced. We assume that low flow water would flow into the hole and into the base gravel and was never seen in the outflow until it increased above seepage rates. It was odd that we did not see flows after construction activities but given the higher precipitation levels so far this year and the mid season rain on snow, we do not see this as an anomaly.

We fully expect flows through the spillway this year so we should be able to determine if spillway flows affect drain 2 and drain 1. Extra care will need to be taken to make sure the trash rack remains clear, weeds are removed from the stilling pond and the spillway is kept clean and clear of debris.

HAZWOPER UPDATES

We continue to conduct safety meetings at the beginning of each inspection. All personnel have current certifications, equipment is in good condition and we have no personnel issues. Personnel were again reminded to think about the layers of clothing that will be needed under the Tyvek suits in the winter weather. As the temperature drops more layers may be required. It must be remembered that clothing under Tyvek suits cannot be removed onsite and yet over heating is an ever present concern.

The snowmobiles and 4-wheeler have a very limited carrying capacity and do not allow us to haul water or equipment onsite for decontamination. During this inspection no water was available to use with the pressure wash equipment. Extra care was taken to limit the possibility of contamination onsite. Due to the amount of snow and the hard frozen ground there was no contamination encountered. Extreme care was taken on the site not to encounter water and mud and to stay on the frozen, snow covered ground. As such, the inspection continued as scheduled.

During the decontamination there was no observed dirt or frozen material on personnel or equipment. Decontamination was conducted by brushing the snow off of the equipment and inspecting until no dirt or ice was found. The equipment decontamination was successful and the outer Tyvek suits were removed at the contaminate reduction area and the vehicles transported to the site trailer. The inside Tyvek suits and masks were removed at the trailer. All decontamination procedures were completed at the support trailer due to logistics.

Clearly, frozen conditions require a special decontamination protocol that will be temperature and snow or ice cover related. The protocol for equipment and decontamination in cold weather will require a comparison of the on site conditions to personnel safety, public safety and overall efficiency.

CONCLUSION

No significant anomalies or changes were noted. We are continuing to see increasing inflows, piezometer levels and flow through the dam to the drains. As outflows have surpassed inflows, stabilized readings should occur next month. Drain 2 had water flowing which has not been observed before. Drain 2 will be monitored closely in the coming months to watch for changes or sedimentation in the flow.

All elements inspected show no major issue or concerns this month that have not already been addressed. Inflows and reservoir levels are low to very low as expected. We anticipate flow through the spillway this year as we have sustained more normal precipitation levels so far this year. Extra care must be taken to make sure the trash rack and spillway remains clean and clear of debris.

On site work is complicated and made more hazardous by cold weather. Better communication may be needed to have equipment that provides adequate access for all personnel scheduled to participate in the inspection.

RECOMMENDATIONS

No maintenance issues at this time. Continue to closely monitor inflow, piezometer readings and drain 6 outflows for fluctuations. Watch for changes in drain 1 and drain 2 flows. Monitor spillway flows and drain 1 and drain 2 flows to see if there is a correlation.

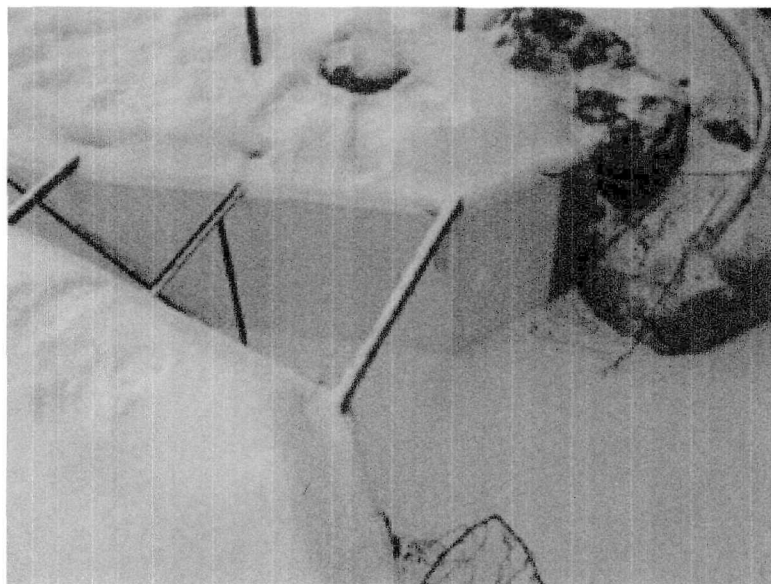
High spring flows and flows through the spillway are anticipated. It is recommended that snow pack, precipitation and temperature be monitored this spring to assure personnel is on site or available to be on site in the event of a large rain event or rapid snow melt.

It is recommended that a weather related personnel, equipment and decontamination protocol be established by BHI and Chapman Construction. It is recommended that the Emergency Action Plan be updated to include winter access conditions.

APPENDIX 1

SITE PHOTOGRAPHS

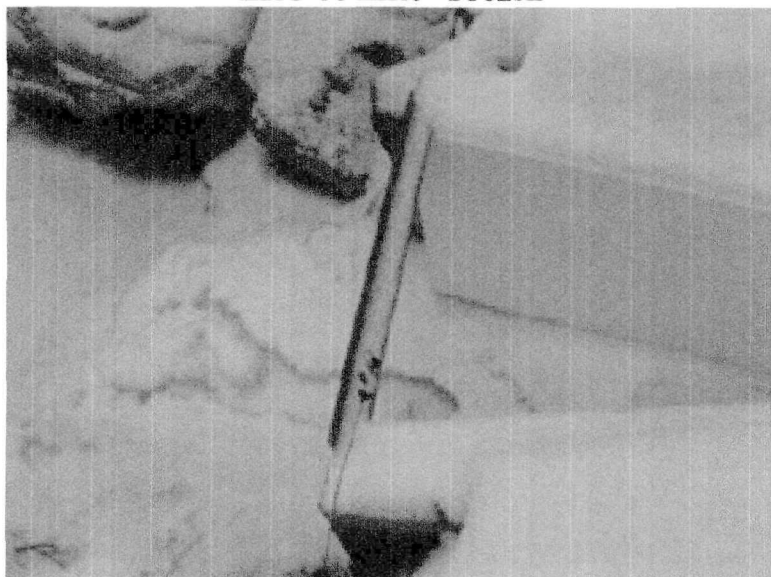
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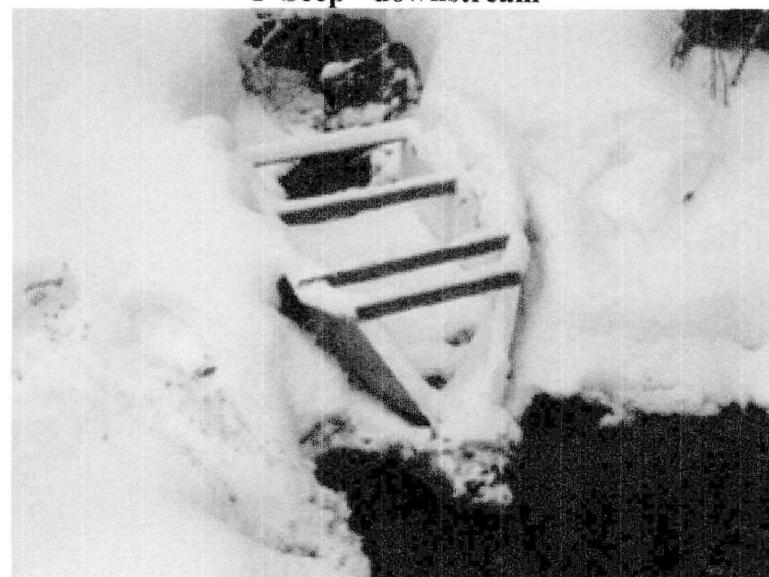
LRC-06 Inlet - Frozen



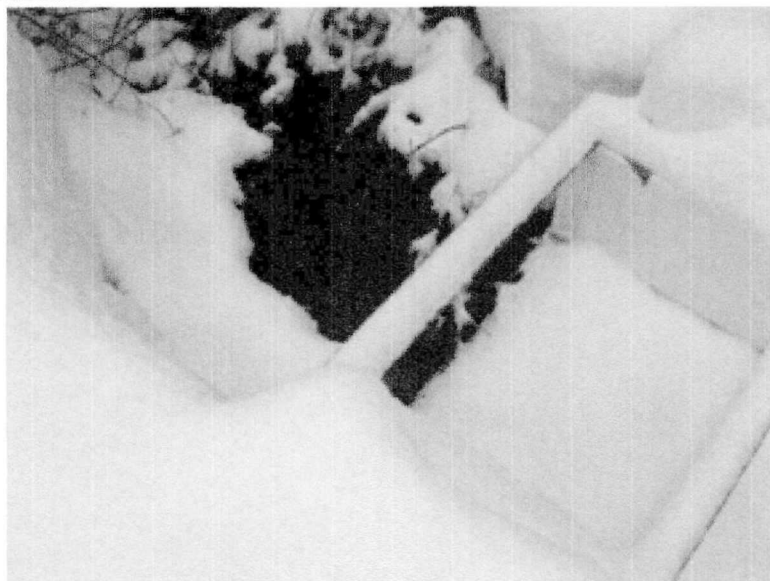
F-Seep - downstream



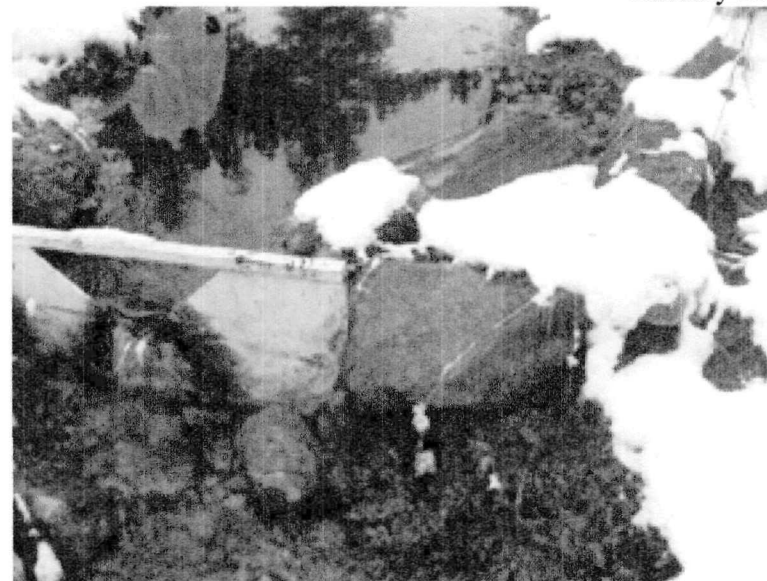
LRC-06 Outlet



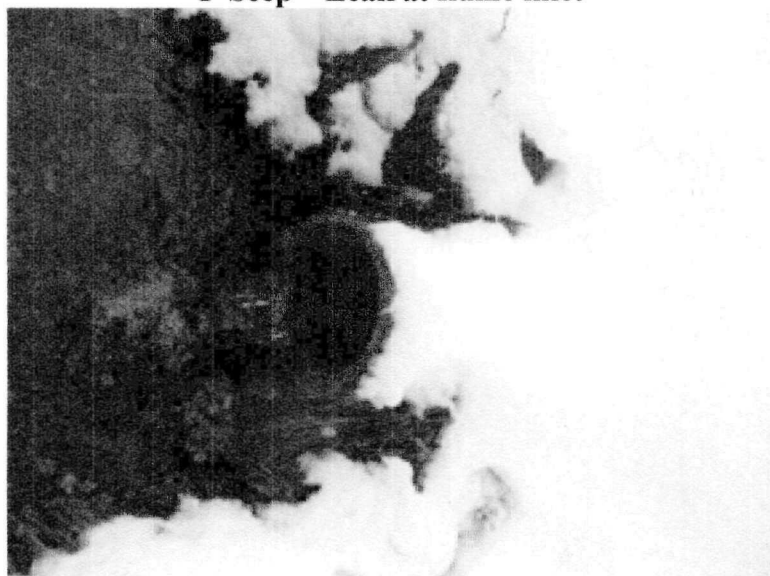
F-Seep – Leak all flows beneath flume



F-Seep – Leak at flume inlet



Weir Drain 12



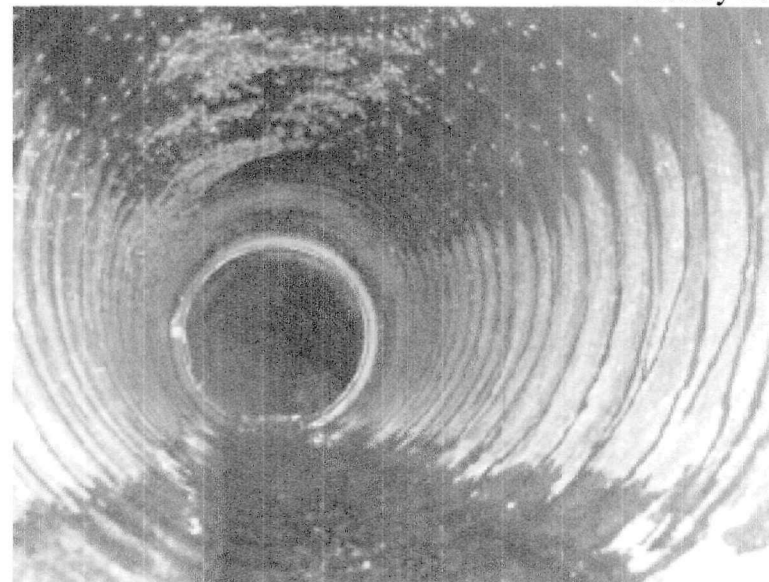
Drain 12



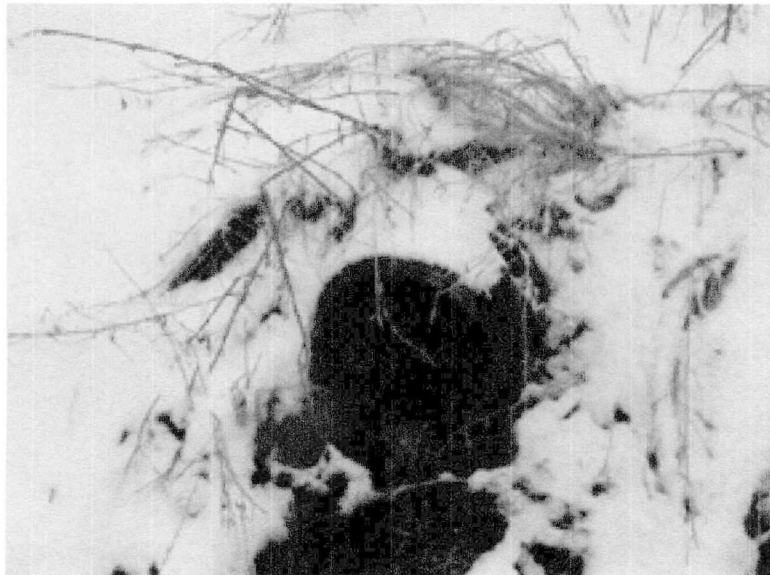
Flows below Weir 12



Flows downstream Drain 11



Inside Drain 11



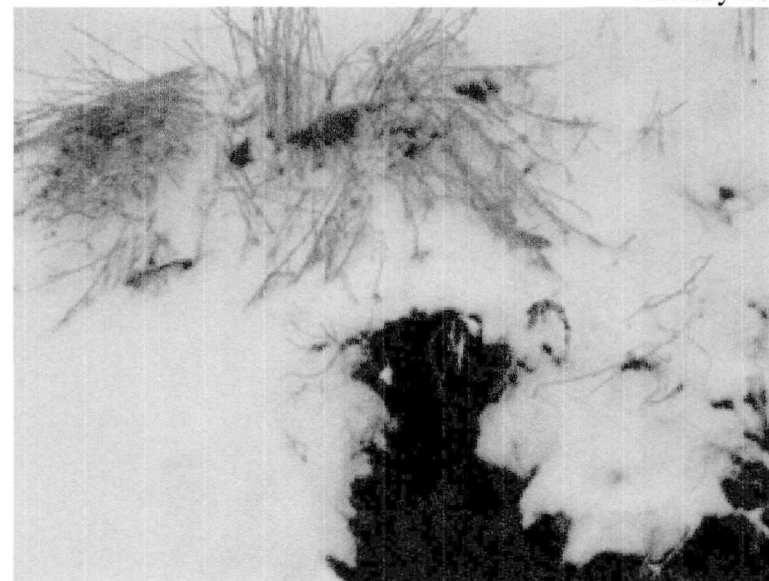
Drain 11



Inside Drain 10



Looking upstream to Drain 9



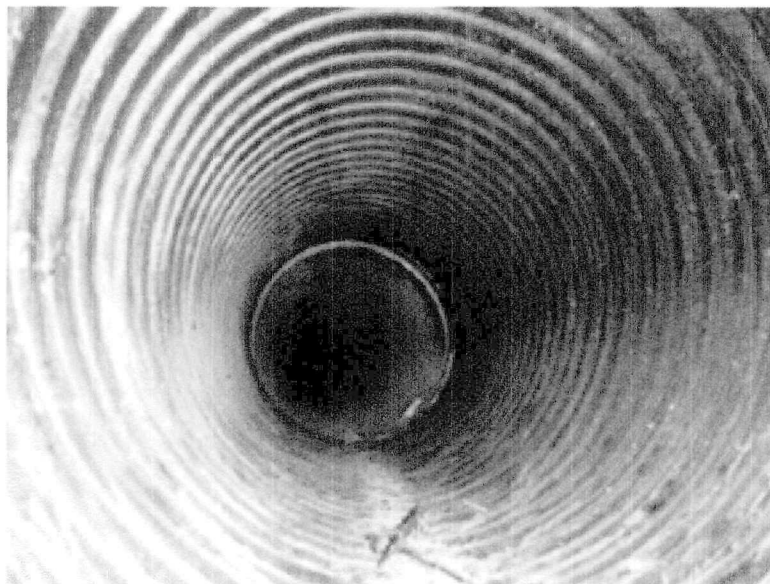
Drain 8



Inside Drain 8



Drain 7



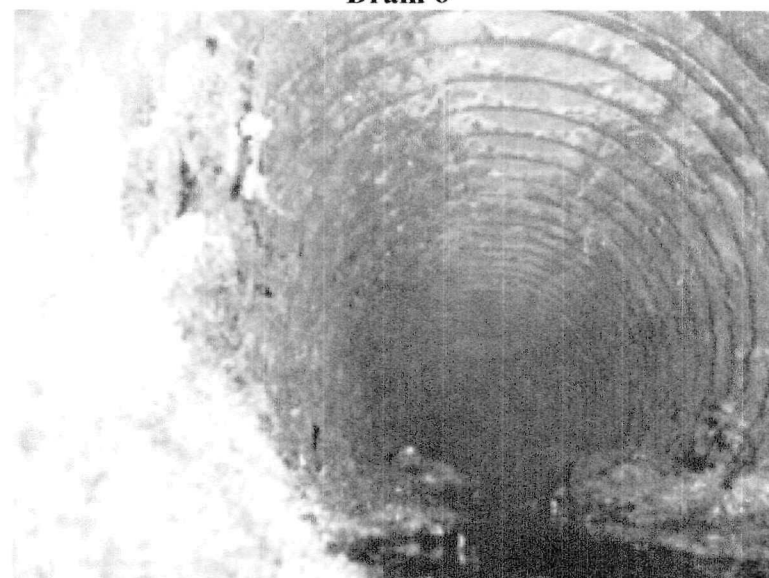
Inside Drain 7



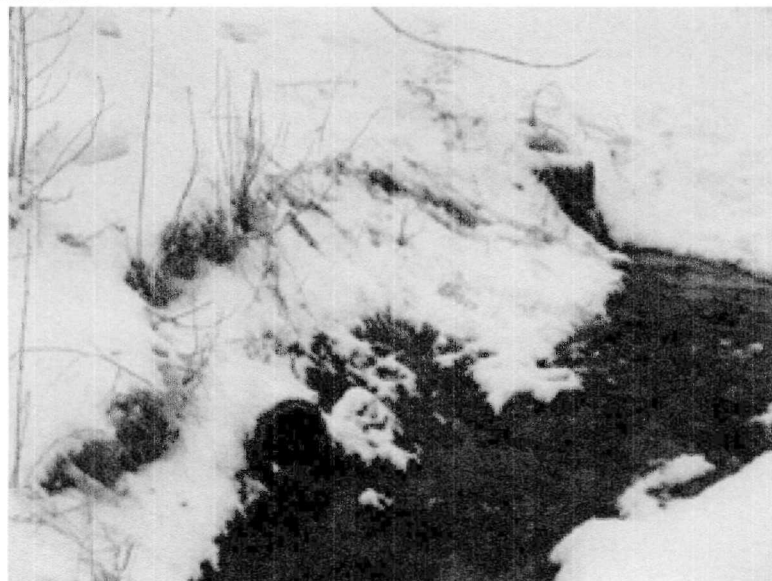
Drain 6



Drains 7 and 8



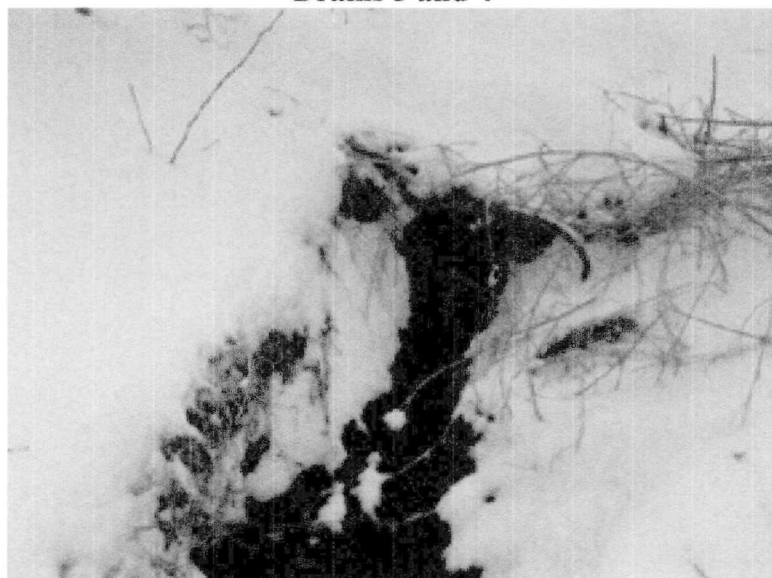
Inside Drain 5



Drains 3 and 4



Inside Drain 4



Drain 4



Drain 3



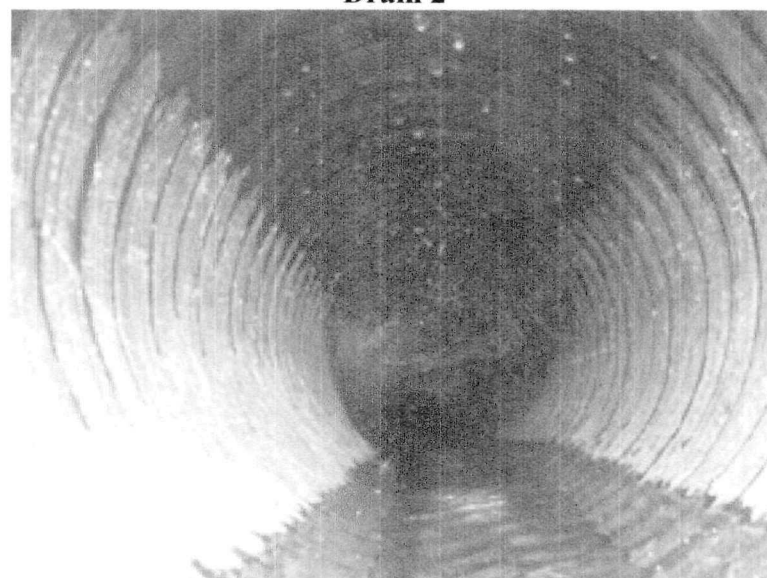
Inside Drain 3



Drain 2



Culvert from Drains 1 and 2



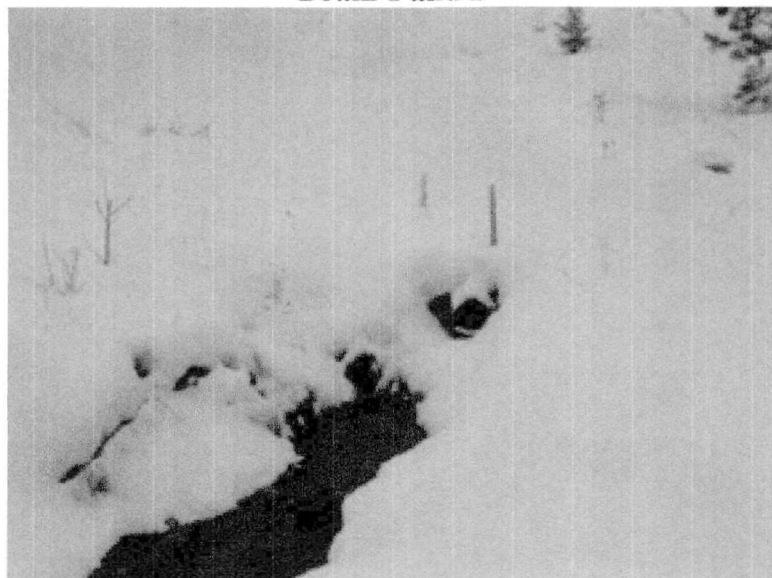
Inside Drain 2



Drain 1 and 2



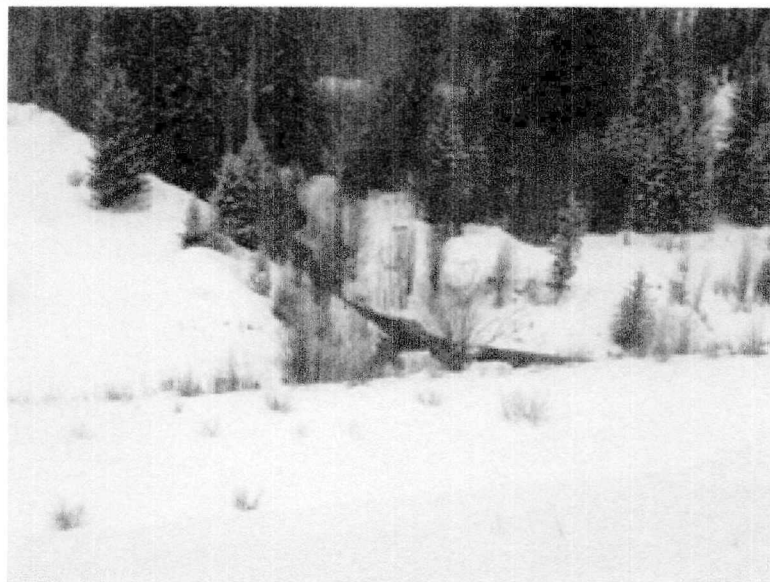
Right abutment of downstream face



Drains 1 and 2



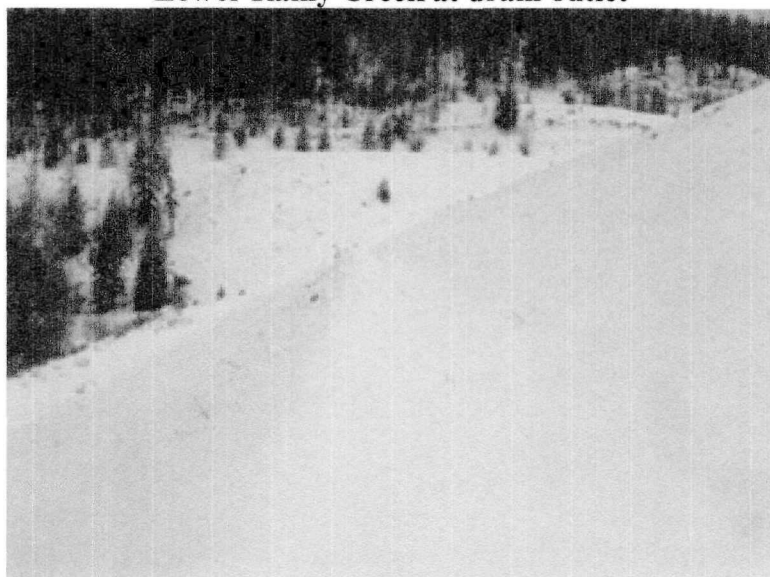
Right abutment – downstream face



Lower Rainy Creek at drain outlet



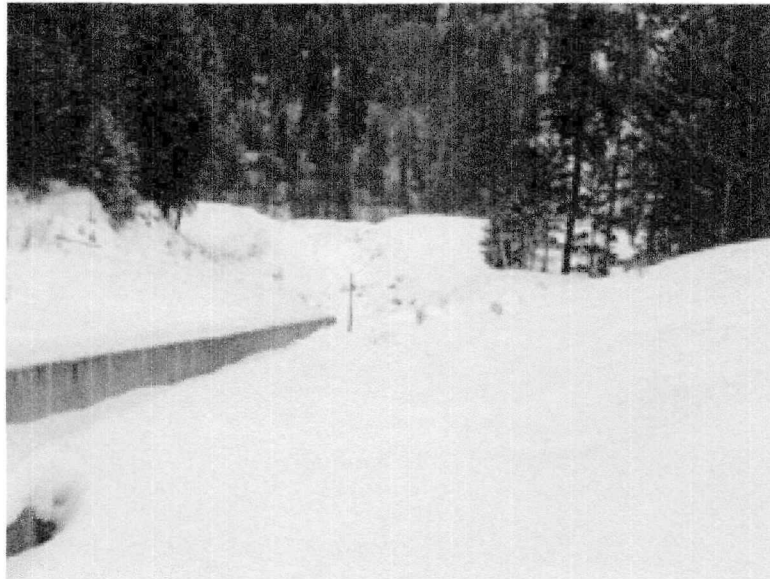
Downstream dam crest



View of downstream face – lift 2 berm



View of downstream dam face



Looking down steep chute



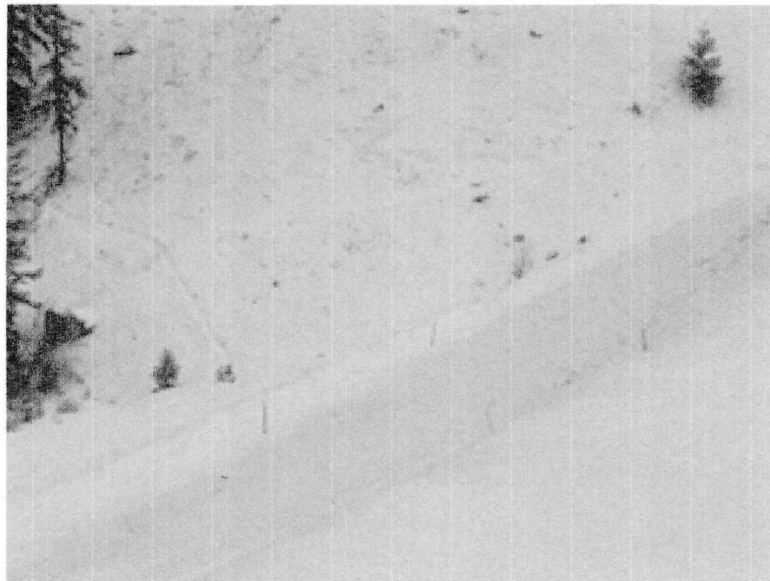
Looking out over downstream dam face



Looking down dam face to lower rainy creek below drains



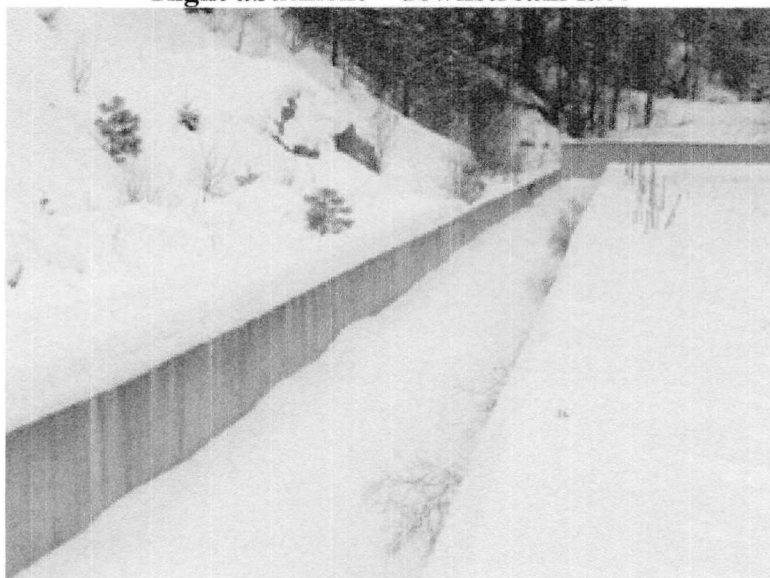
Piezometer Reading



Right abutment – downstream face



Box culvert outlet



Spillway



Outlet box culvert



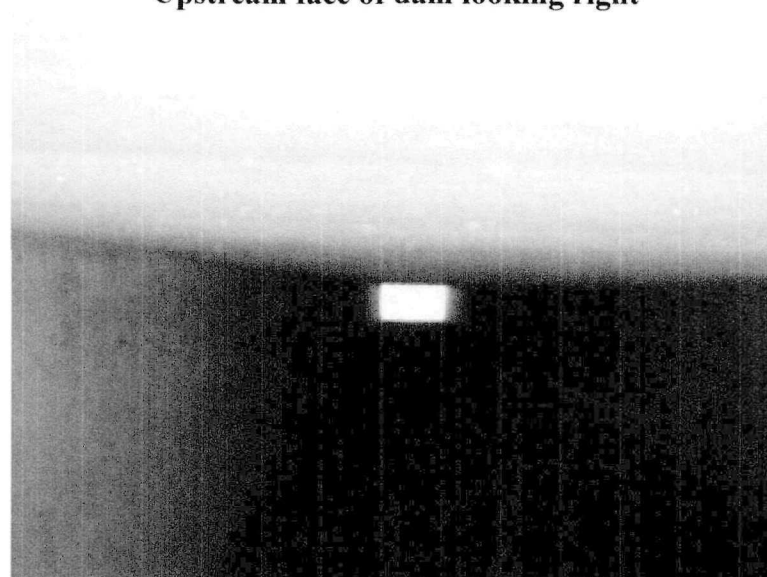
Spillway below box culvert



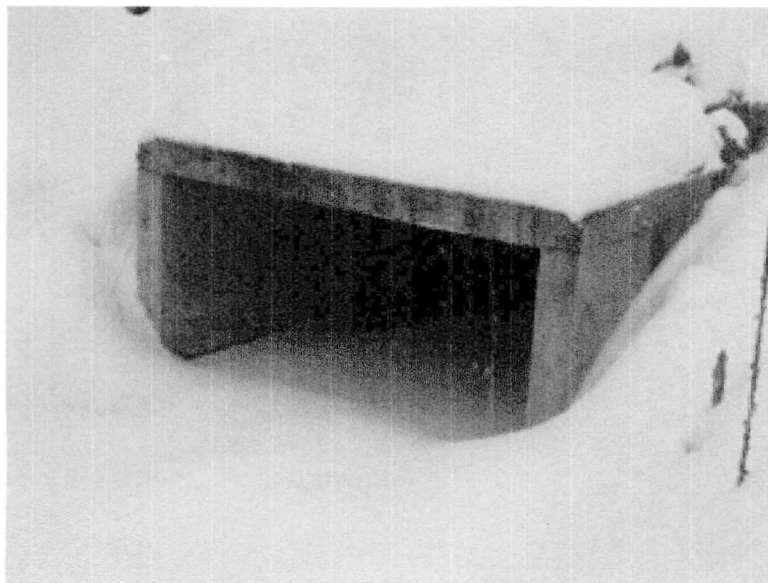
Upstream face of dam looking right



Downstream face of dam looking right



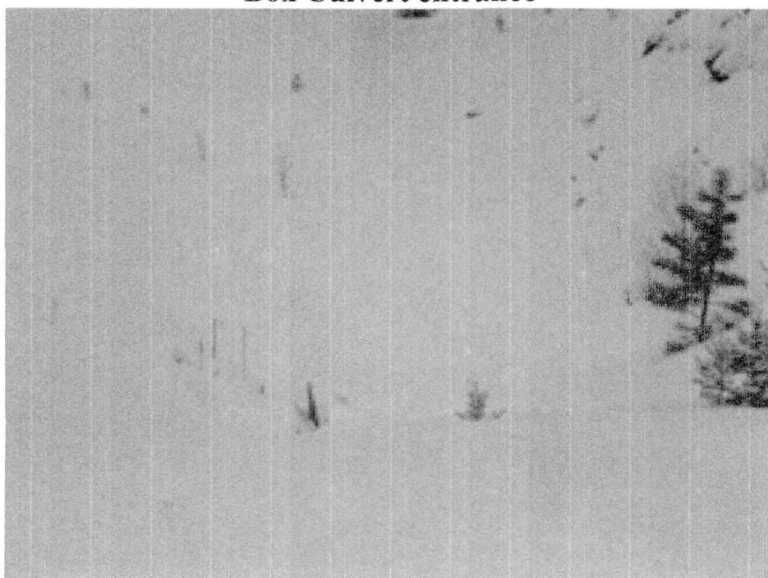
Inside Box Culvert



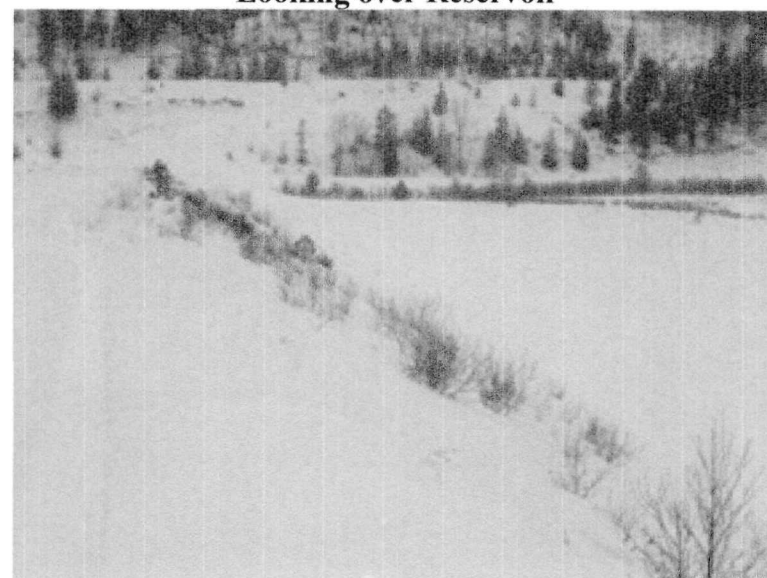
Box Culvert entrance



Looking over Reservoir



Looking down to box culvert entrance



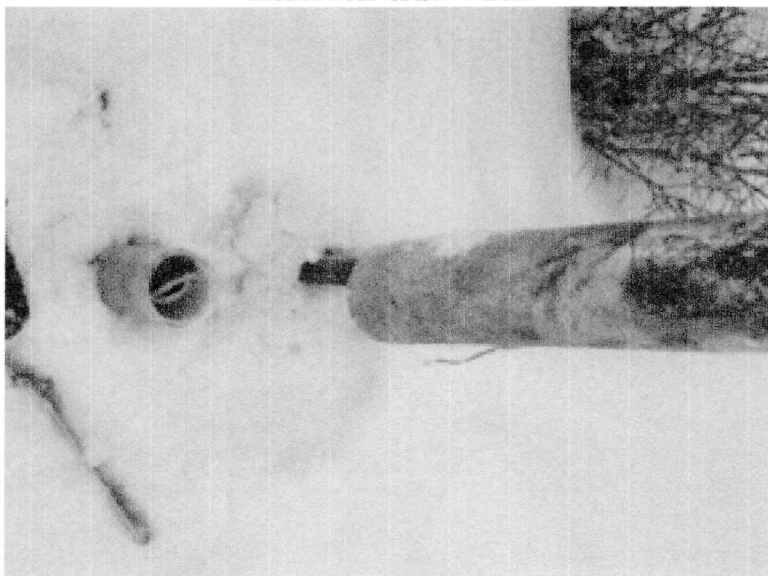
Upstream crest of dam looking right



Reservoir trash rack



Tubes inside piezometer PO



Piezometer PO



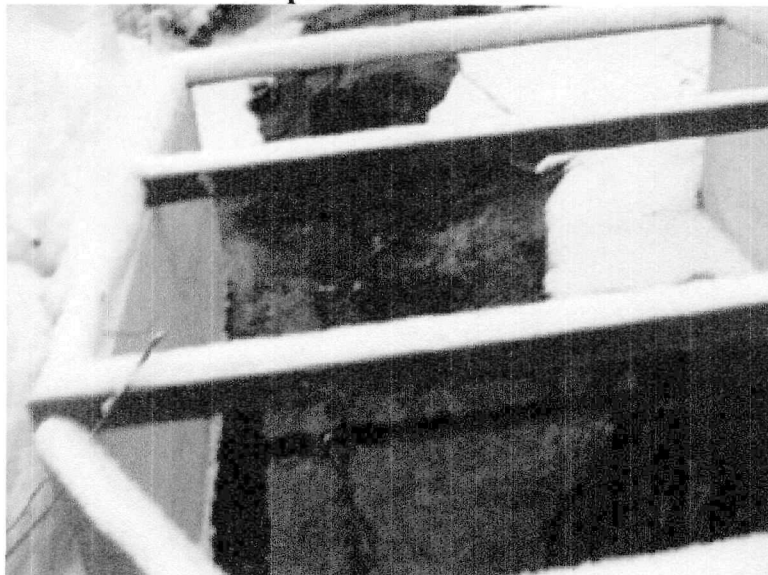
URC-02 Gauge



Upstream URC-02



Upstream LRC-02



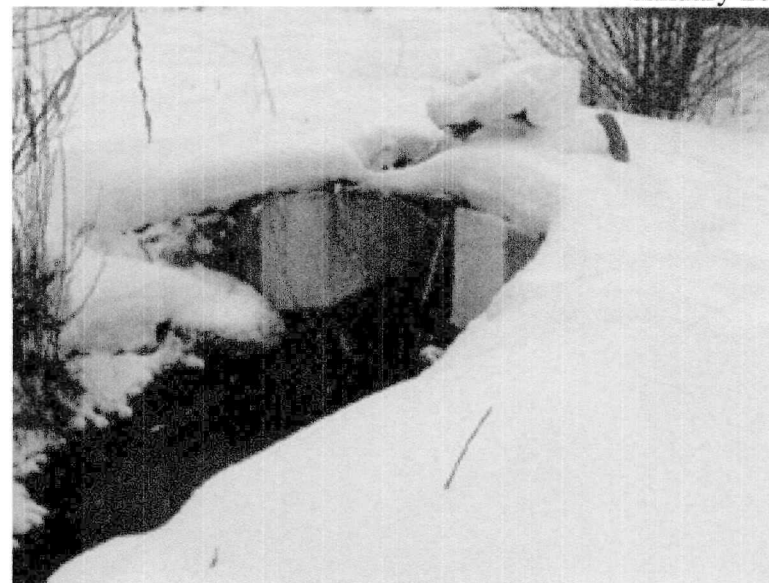
URC-02 Flume looking upstream



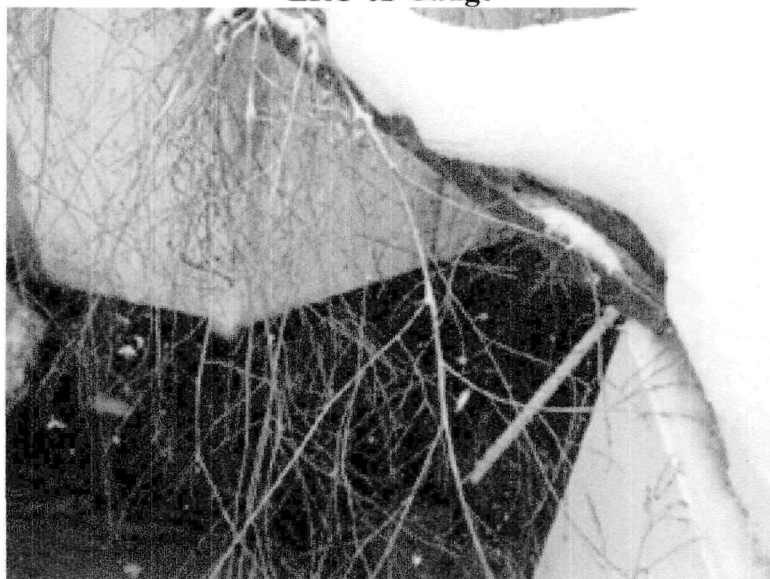
Downstream LRC-02



LRC-02 Gauge



LRC-02 Flume



LRC-02 Inlet



Inside CC-02 Flume



CC-02 Flume - Frozen



Culvert downstream of CC-02

APPENDIX 2

PERIODIC INSPECTION REPORT & FIELD NOTES

PRINCIPAL INSPECTOR ON SITE: Kurt Hafferman, P.E.		OBSERVATION DATE (S)		4-Feb-11			
OTHER PERSONNEL ON SITE: Dan Nelson from BHI and Brandon Chapman and Jeremy Peterson from Chapman Const.		WEATHER CONDITIONS		Cldy, cool ~34°, calm, light snow/rain, ±8" of snow on ground			
Work Tasks: Measure flows, check URC02, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, gauge height at LRC01, CC02, LRC02 and LRC06. Replace gauge on LRC-01 to reflect modified flows from earlier repairs.		EQUIPMENT		Well probe, long fiberglass tape, camera, flashlight, misc. field equip.			
AREA INSPECTED	EMBANKMENT			CHECK ACTION NEEDED			
	ITEM NO.	CONDITION	OBSERVATION	MONITOR	INVESTIGATE	REPAIR	OTHER
CREST	1	GENERAL SURFACE CONDITION	Good, no change				
	2	DISPLACEMENTS	None				
	3	EROSION	None				
	4	CREST ALIGNMENT	Good, no change				
	5	WEEDS OR BRUSH	No change				
	6	ANIMAL BURROWS	No change				
	7	EARTHEN EMERGENCY SPILLWAY	Good, no change				
	8						
	9						
UPSTREAM FACE	10	SLIDES, DISPLACEMENT OR BUDGES	None				
	11	EROSION	None				
	12	WEEDS OR BRUSH	None				
	13	PIEZOMETER CASINGS	Good, no change				
	14	ABUTMENT CONTACTS	Good, no change				
	15	ANIMALS BURROWS	No change				
	16	DISTANCE TO WATER	~850 ft. reservoir at typical low level				
	17						
	18						
	19						
ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE							
1							

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Kurt Hafferman, P.E.	OBSERVATION DATE (S)	2/4/11
OTHER PERSONNEL ON SITE: Dan Nelson from BHI and Brandon Chapman and Jeremy Peterson from Chapman Const.	WEATHER CONDITIONS	Cldy, cool ~34°, calm, light snow/rain, ±8" of snow on ground
Work Tasks: Measure flows, check URC02, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, gauge height at LRC01, CC02, LRC02 and LRC06. Replace gauge on LRC-01 to reflect modified flows from earlier repairs.	EQUIPMENT	Well probe, long fiberglass tape, camera, flashlight, misc. field equip.

	ITEM NO.	DOWNSTREAM AND INSTRUMENTATION		CHECK ACTION NEEDED			
		CONDITION	OBSERVATION	MONITOR	INVESTIGATE	REPAIR	OTHER
DOWNSTREAM SLOPE AREA INSPECTED	20	GENERAL SURFACE CONDITION	Good no change				
	21	DISPLACEMENTS	None				
	22	EROSION	None				
	23	LIFT ALIGNMENTS	Good				
	24	WEEDS OR BRUSH	No change				
	25	ANIMALS BURROWS	No change				
	26	EARTHEN EMERGENCY SPILLWAY	Good, no change				
	27	SEEPAGE	None				
INSTRUMENTATION	28	ABUTMENT CONTACTS	Good, no change				
	29	PIEZOMETERS	Measured, see attached measurements	X			
	30	WEIRS	Gauges read, see attached	X			
	31	FLUMES	Gauges read, see attached	X			
	32	RESERVOIR LEVELS	Not read - typical low levels	X			
	33	RAINY CREEK INFLOW MEASUREMENTS @ URC02	GH= 0.38, Increase 19.3 gpm	X			
	34	RAINY CREEK OUTFLOW BELOW DAM @ LRC01	GH= 0.20, 364 gpm	X			
	35	STREAM OUTFLOW BELOW MILL POND @LRC02	GH=0.45, 514 gpm	X			
	36	STREAM OUTFLOW FROM CARNEY CREEK @CC02	Frozen, Not read	X			
	37	STREAM OUTFLOW FROM RAINY CREEK @LRC06	Frozen, Not read	X			
	38	FLUME 1-2-3-4	GH=0.14, 12.7 gpm	X			

ADDITIONAL COMMENTS REFER TO ITEM NO. IF APPLICABLE

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Kurt Hafferman, P.E.	OBSERVATION DATE (S)	2/4/11
OTHER PERSONNEL ON SITE: Dan Nelson from BHI and Brandon Chapman and Jeremy Peterson from Chapman Const.	WEATHER CONDITIONS	Cldy, cool ~34°, calm, light snow/rain, ±8" of snow on ground
Work Tasks: Measure flows, check URC02, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, gauge height at LRC01, CC02, LRC02 and LRC06. Replace gauge on LRC-01 to reflect modified flows from earlier repairs.	EQUIPMENT	Well probe, long fiberglass tape, camera, flashlight, misc. field equip.

AREA INSPECTED	INSTRUMENTATION (CONT.) AND DOWNSTREAM TOE AREA			CHECK ACTION NEEDED			
	ITEM NO.	CONDITION	OBSERVATION	MONITOR	INVESTIGATE	REPAIR	OTHER
INSTRUMENTATION (CONT.)	39	FLUME 10-11-12	Removed, no longer used				
	40	FLUME 7-8	GH=0.12, decrease 1.21 gpm	X			
	41	WEIR 5	Low flow 0.37 gpm	X			
	42	WEIR 12	GH=0.208, increase 9.55 gpm.	X			
	43	DRAIN 6	Increase 66.74 gpm	X			
	44	SPILLWAY FLOW	None	X			
	45	F-Seep	Leak at flume. No reading	X			
	46	Drain 2	Water flowing	X	X		
DOWNSTREAM TOE	47						
	48	ABUTMENTS	Good, no change				
	49	SEEPAGE NEAR TOE	None noted this year				
	50	SEEPAGE DOWNSTREAM OF TOE, LEFT SIDE	Gauge not read	X	X		
	51	SEEPAGE IN STREAM CHANNEL, LEFT SIDE	Not noticed due to snow				
	52	VEGETATION	No Change.				
	53	CULVERT AT LOWER ROAD	Not monitored				
	54						
	55						
	56						

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

Item 47 - Flow observed in drain 2 for first time. Likely due to increasing flows and construction activities last year to fix the drain. BHI will closely monitor any changes in the future. No other anomalies noted.

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Kurt Hafferman, P.E.	OBSERVATION DATE (S)	2/4/11
OTHER PERSONNEL ON SITE: Dan Nelson from BHI and Brandon Chapman and Jeremy Peterson from Chapman Const.	WEATHER CONDITIONS	Cldy, cool ~34°, calm, light snow/rain, ±8" of snow on ground
Work Tasks: Measure flows, check URC02, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, gauge height at LRC01, CC02, LRC02 and LRC06. Replace gauge on LRC-01 to reflect modified flows from earlier repairs.	EQUIPMENT	Well probe, long fiberglass tape, camera, flashlight, misc. field equip.

AREA INSPECTED	SPILLWAYS			CHECK ACTION NEEDED			
	ITEM NO.	CONDITION	OBSERVATION	MONITOR	INVESTIGATE	REPAIR	OTHER
PRINCIPAL SPILLWAY (BOX CULVERT AND OPEN CHANNEL CHUTE SPILLWAY)	58	ENTRANCE CONDITION	Good, no change				
	59	CENTERLINE CRACK FLOOR	Checked, no visual change	X			
	60	CENTERLINE CRACK CEILING	Checked, no visual change	X	X		
	61	TRANSVERSE JOINTS	No change, same CaCo3 deposits				
	62	GENERAL CONCRETE	Good to excellent, no change				
	63	SEEPAGE OR WATER	No moisture seen	X			
	64	OPEN CHANNEL CONCRETE	Good to excellent, no change				
	65	OPEN CHANNEL JOINTS	Good to excellent, no change				
OPEN CHANNEL STEEP CHUTE SPILLWAY	66	OPEN CHANNEL GENERAL	Good				
	67	JOINTS	Good				
	68	WALL CONCRETE	Visual from above, good				
	69	FLOOR CONCRETE	Visual from above, good				
	70	WALL TOPS	Good				
	71	WEEDS ALONG WALLS	None noted				
	72	STILLING BASIN RIPRAP	Good				
	73	WEED AND BRUSH IN STILLING BASIN	Cleared last fall, will be needed in spring.				
	74						
	75						
	76						

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Kurt Hafferman, P.E.

OBSERVATION DATE (S)

2/4/11

OTHER PERSONNEL ON SITE: Dan Nelson from BHI and Brandon Chapman and Jeremy Peterson from Chapman Const.

WEATHER CONDITIONS

Cldy, cool ~34°, calm, light snow/rain, ±8" of snow on ground

Work Tasks: Measure flows, check URC02, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, gauge height at LRC01, CC02, LRC02 and LRC06. Replace gauge on LRC-01 to reflect modified flows from earlier repairs.

EQUIPMENT

Well probe, long fiberglass tape, camera, flashlight, misc. field equip.

AREA INSPECTED	RESERVOIR AND UPSTREAM DRAINAGE BASIN			CHECK ACTION NEEDED			
	ITEM NO.	CONDITION	OBSERVATION	MONITOR	INVESTIGATE	REPAIR	OTHER
RESERVOIR	77	LEFT SIDE (TAILINGS SLOPE)	Stable				
	78	RIGHT SIDE	Stable				
	79	RESERVOIR LEVEL	Low level - Below gauge	X			
	80	WETLANDS	Good, no change				
	81	UPPER POND	Full, no change				
	82	DISTANCE FROM UPSTREAM SLOPE	~ 850 ft. typical low reservoir level	X			
	83						
	84						
UPSTREAM DRAINAGE BASIN	86	PRECIPITATION WY 2010-2011 AS OF DATE OF INSP	Low, 65% of normal	X			
	87	RECENT RAINS	4.9 inches of precipitation in the last month. At least one rain on snow event	X			
	88	FIRE DANGER	None				
	89	CHANGES	None				
	90	VEGETATION	No change				
	91	RAINY CREEK DRAINAGE	No change				
	92	FLEETWOOD CREEK DRAINAGE	No change				
	93	MINE SITE	Shut Down for winter				
	94						
	95						

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

KOOTENAI DEVELOPMENT IMPOUNDMENT DAM ROUTINE OWNERS INSPECTION REPORT

PRINCIPAL INSPECTOR ON SITE: Kurt Hafferman, P.E.

OBSERVATION DATE (S)

2/4/11

OTHER PERSONNEL ON SITE: Dan Nelson from BHI and Brandon Chapman and Jeremy Peterson from Chapman Const.

WEATHER CONDITIONS

Cldy, cool ~34°, calm, light snow/rain, ±8" of snow on ground

Work Tasks: Measure flows, check URC02, take reservoir level, measure piezometers, check crack in box culvert, check drains, drain flow, gauge height at LRC01, CC02, LRC02 and LRC06. Replace gauge on LRC-01 to reflect modified flows from earlier repairs.

EQUIPMENT

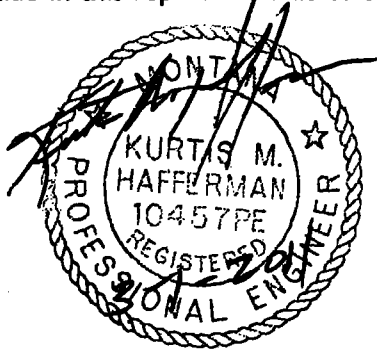
Well probe, long fiberglass tape, camera, flashlight, misc. field equip.

AREA INSPECTED	EARTHEN SPILLWAY AND MILL POND AND OTHER			CHECK ACTION NEEDED			
	ITEM NO.	CONDITION	OBSERVATION	MONITOR	INVESTIGATE	REPAIR	OTHER
EARTHEN SPILLWAY	96	LEFT SIDE NEXT TO CREST	Good, no change				
	97	RIGHT SIDE	Good, no change				
	98	RESERVOIR LEVEL	Low, minimum level - Below Guage				
	99	RIPRAP	Good, no change				
	100	ROAD CONDITION	Good, no change				
	101	DOWNSTREAM SLOPE	Good, no change				
	102						
	103						
MILL POND	105	CREST	Good				
	106	UPSTREAM FACE	Good				
	107	DOWNSTREAM FACE	Good				
	108	SPILLWAY FLOW	Low flow in spillway this year				
	109	RIPRAP IN SPILLWAY	Good, no change				
	110	ANIMALS ON EMBANKMENT	Not seen due to snow	X			
	111	ANIMALS IN SPILLWAY	No, beaver not present				
	112	RESERVOIR LEVEL	Low	X			
OTHER	113	Animals Monitoring	None noted during this visit.	X			

ADDITIONAL COMMENTS, REFER TO ITEM NO. IF APPLICABLE

Engineers Certification and Seal

I declare that the data collection and completion of this report titled the January 2011 Routine Owners Inspection Report for the Kootenai Development Impoundment Dam, known as the subject property was completed under my direction. This assessment has revealed the conditions discussed in the inspection form in connection with the property. I declare that the statements made in this report are true to the best of my belief and professional knowledge.



Kurtis M. Hafferman, P.E.

MT PE 10457

Date

77

OVERCAST, LIGHT
CLOUD / RAIN - 79°

R-56.1

KDID

JANUARY INSPECTIONS

DAN - BHI

KMH - BHI

SERENY - CHAPMAN

BRANDON - CHAPMAN

ARRIVE 10:00 DEPART 1:15

FLUMES

CL-02

FROZEN - NO READING

LRL-02

GH = 0.45'

36°F

URS-01

GH = 0.38'

F-SEEP - N/A - RECAL

ALL LEAKING UNDER FLUME

LRL-01

47°

NEW GH = 0.20'

OLD GH = 0.73'

LRC-06

FROZEN - NO READING

F 1,2,3,4

GH = 0.14'

F 7,8

GH = 0.12'

W5 = 0.5"

W12 = 2.5" * ADD 0.25" FOR LEAKAGE

Perimeters

P

100.4' DRY

P1

103.72' DRY

P2

118.64'

WATER

122.24'

BOT

P3

60.49 DRY

P4

106.23' DRY

P5

104.34' DRY

PM6

65.75' DRY

PM2

103.16

WAT

104.77'

BOT

PM5

50.06'

DAMP

PM4

41.17'

DRY

PM3

51.77'

DRY

PM1

51.61' WAT

54.82' BOT

A8

07.21' WET

28.21' BOT

DRAINS

- D1 DRY
- D2 47° - * LOW FLOW - NONE PREVIOUSLY
NOTED
- D3 LOW FLOW CLEAR/STEADY
- D4 LOW FLOW CLEAR/STEADY 47°
- F1234 GH = 0.14'
- D5 = V LOW FLOW CLEAR/STEADY 47°
GH = 0.5'
- D6 = LOW FLOW CLEAR/STEADY 47°
GH = 11" BTP
- D7 DRY
- D8 - LOW FLOW CLEAR/STEADY 47°
- F78 GH = 0.12'
- D9 - LOW FLOW CLEAR/STEADY
49°
- D10 - LOW FLOW CLEAR/STEADY 49°
- D11 - LOW FLOW CLEAR/STEADY 52°

83

- W12 - GH = 2.5" ADD 0.25" FOR
LEAKS AROUND
- D12 MED FLOW CLEAR/STEADY 50°

LRC-01

MARSH MCBIRNEY

DIST	W	DEPTH	A	VEL.	Q
1.8	0.1	0	Q	0	
2.0	0.35	0.2	0.07	0.01	0.1087
2.5	.50	0.2	0.1	0.70	0.107
3.0	.50	0.2	0.1	1.38	0.133
3.5	.50	0.22	0.1	0.65	0.2715
4.0	.50	0.25	0.125	1.09	0.136
4.5	.50	0.2	0.1	1.03	0.103
5.0	.50	0.2	0.1	0.71	0.071
5.5	.50	0.2	0.1	0.96	0.096
6.0	.50	0.2	0.1	0.49	0.049
6.5	.50	0.2	0.1	0.59	0.059
7.0	.30	0.2	0.06	0.29	0.0174
7.1	.05	0		0	0

5.3 5.3 Q = 0.8116

Q = 364.3

85

APPENDIX 3

UPDATED PIEZOMETER DATA AND GRAPHS

[illegible]

From S:\DOCUMENT\JOB FILES\Jobs\IR_56_01\Documents\Annual Inspection\PIEZOMETERS

Billmayer & Hafferman Inc.

Kootenai Development Impoundment Dam Annual Inspection

3-Nov-10 Last Update

Hafferman

Bold = Interpolated values

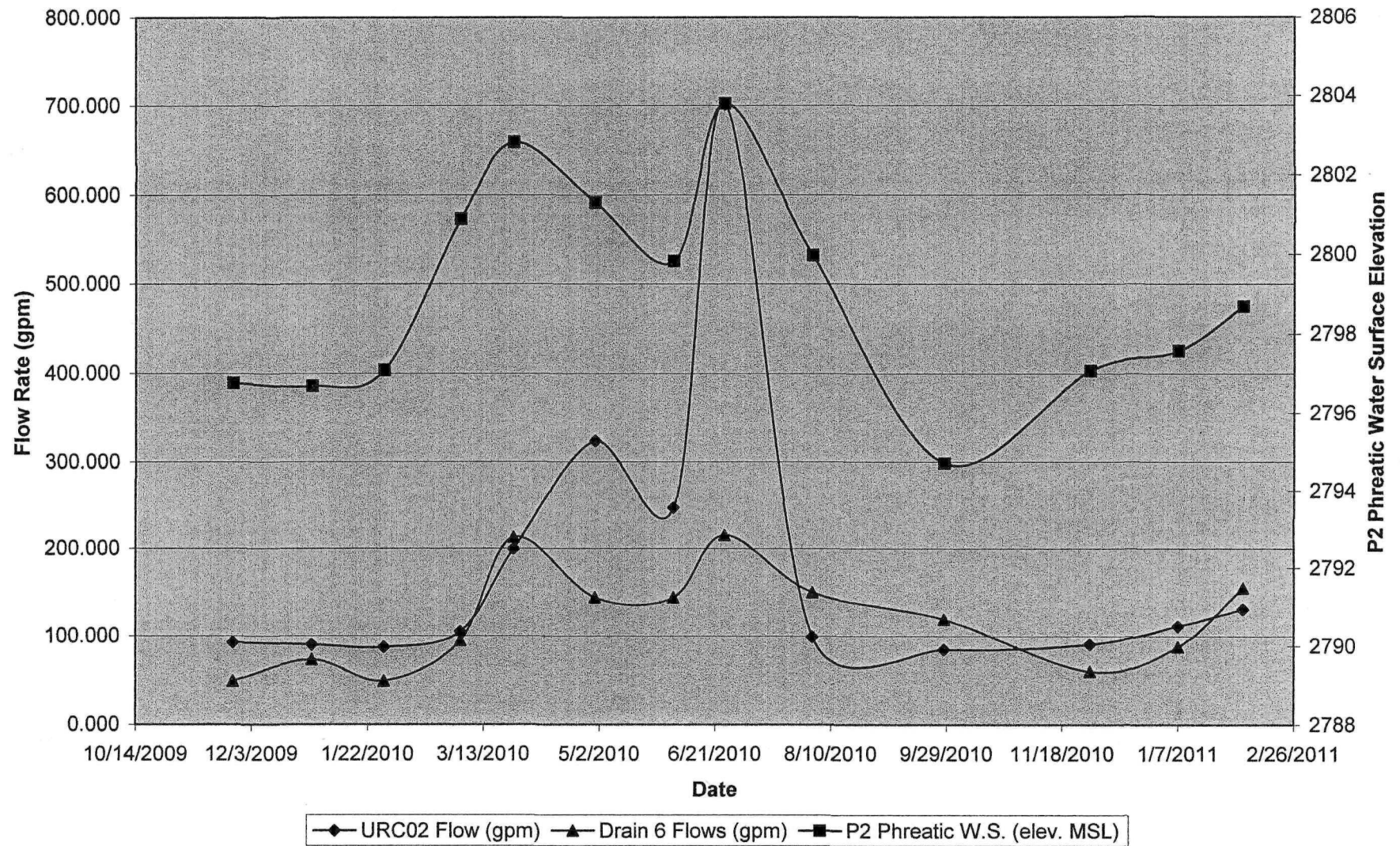
Wet Piezometer Plots

Piezometer Num P2 Elev.				PM1 Elev.			PM2 Elev.			A8 Elev.		
G.S.= 2917.321				G.S.= 2845.852			2915.04			G.S.= 2792.7		
Date	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev
2/4/2011	118.64	122.24	2798.681	51.61	54.82	2794.242	103.16	104.77	2811.88	7.21	28.21	2785.49
1/7/2011	119.75	122	2797.571	51.95	54.85	2793.902	103.85	104.8	2811.19	8.15	28.2	2784.55
11/30/2010	120.25	122.3	2797.071	52.5	54.85	2793.352	104.25	104.8	2810.79	8.26	28.2	2784.44
10/29/2010	120.68	122	2796.641	52.92	54.85	2792.932	104.43	104.95	2810.61	8.3	28.2	2784.40
9/28/2010	122.6	122.1	2794.721	53.15	54.8	2792.702	104.4	104.8	2810.64	8.34	28.3	2784.36
8/2/2010	117.35	122.1	2799.971	52.15	54.8	2793.702	102.3	104.6	2812.74	6.96	28.3	2785.74
6/25/2010	113.52	122.1	2803.801	51.41	54.8	2794.442	100.67	104.6	2814.37	6.75	28.3	2785.95
6/3/2010	117.5	122.1	2799.821	52.44	54.8	2793.412	102.27	104.6	2812.77	7.4	28.3	2785.30
3/26/2010	114.49	122.1	2802.831	53.39	54.8	2792.462	103.62	104.6	2811.42	8.19	28.3	2784.51
3/3/2010	116.42	122.1	2800.901	52.25	54.8	2793.602	102.2	104.6	2812.84	7.37	28.3	2785.33
1/29/2010	120.24	122.1	2797.081	53.65	54.8	2792.202	104.6	104.6	2810.44	8.32	28.3	2784.38
12/29/2009	120.64	122.1	2796.681	53.74	54.8	2792.112	104.28	104.6	2810.76	8.37	28.3	2784.33
11/25/2009	120.56	122.1	2796.761	53.71	54.8	2792.142	104.25	104.6	2810.79	8.31	28.3	2784.39
10/23/2009	120.85	122.1	2796.471	53.81	54.8	2792.042	104.22	104.6	2810.82	8.3	28.3	2784.40
9/11/2009	119.91	122.1	2797.411	53.69	54.8	2792.162	103.39	104.6	2811.65	8.2	28.3	2784.50
8/21/2009	118.67	122.1	2798.651	53.42	54.8	2792.432	102.18	104.6	2812.86	7.66	28.3	2785.04
7/24/2009	114.13	122.1	2803.191	52.07	54.8	2793.782	100.41	104.6	2814.63	6.42	28.3	2786.28
6/29/2009	106.36	122.1	2810.961	50.73	54.8	2795.122	97.52	104.6	2817.52	4.75	28.3	2787.95
6/26/2009	105.24	122.1	2812.081	50.6	54.8	2795.252	97.24	104.6	2817.8	4.565	28.3	2788.14
5/27/2009	90.4	122.1	2826.921	45.62	54.8	2800.232	89.6	104.6	2825.44	2.65	28.3	2790.05
5/5/2009	91.68	122.1	2825.641	45.71	54.8	2800.142	88.15	104.6	2826.89	3.41	28.3	2789.29
5/1/2009	91.45	122.1	2825.871	44.56	54.8	2801.292	87.52	104.6	2827.52	3.44	28.3	2789.26
4/30/2009	91.55	122.1	2825.771	44.66	54.8	2801.192	87.81	104.6	2827.23	3.48	28.3	2789.22
4/24/2009	98.18	122.1	2819.141	45.37	54.8	2800.482	92.13	104.6	2822.91	4.59	28.3	2788.11

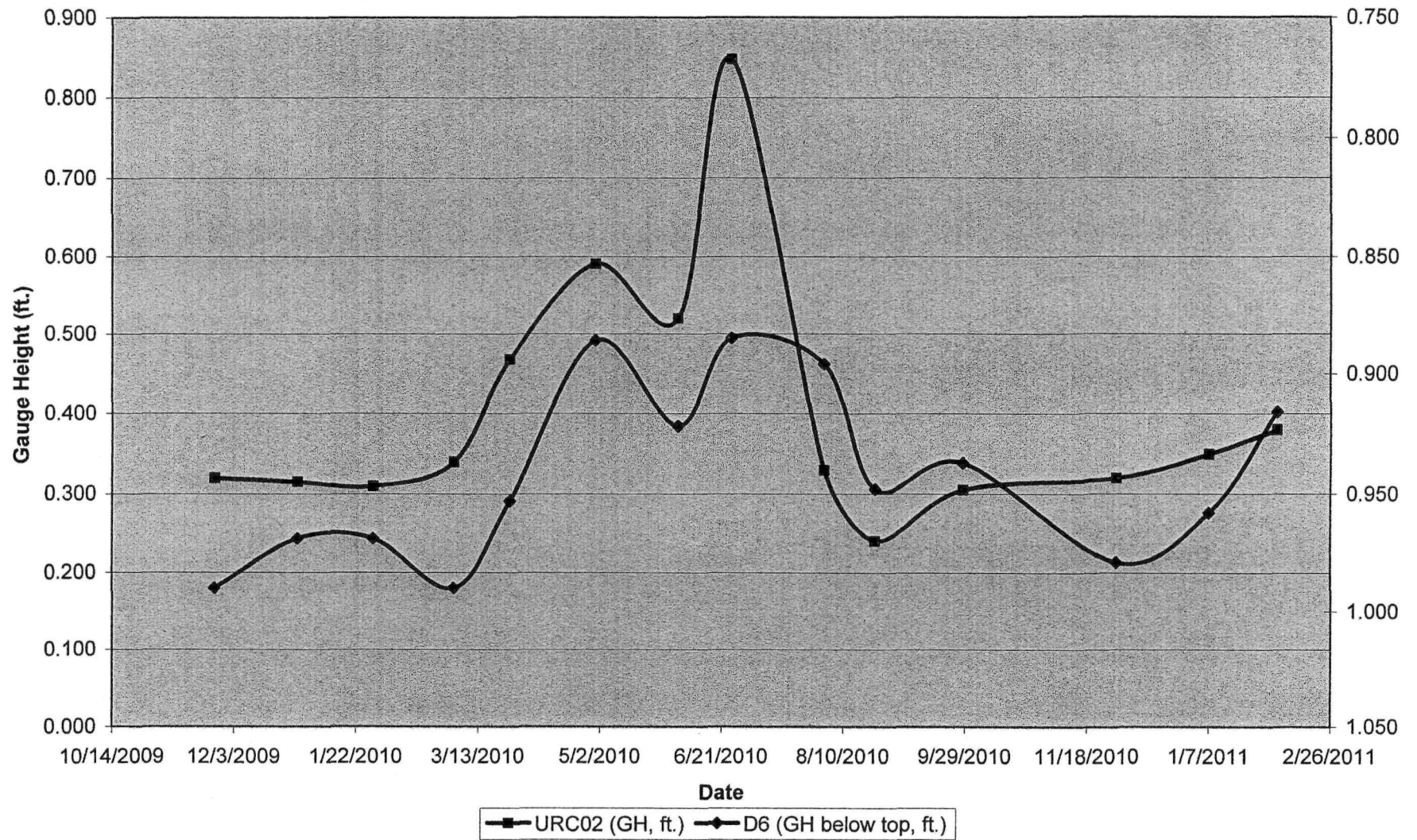
Piezometer Num P2 Elev.				PM1 Elev.			PM2 Elev.			A8 Elev.		
G.S.= 2917.321				G.S.= 2845.852			2915.04			G.S.= 2792.7		
Date	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev
4/13/2009	112.87	122.1	2804.451	51.43	54.8	2794.422	100.24	104.6	2814.8	6.88	28.3	2785.82
2/20/2009	119.9	122.1	2797.421	53.69	54.8	2792.162	103.75	104.6	2811.29	8.2	28.3	2784.50
1/15/2009	120.4	122.1	2796.921	53.86	54.8	2791.992	104.11	104.6	2810.93	8.3	28.3	2784.40
12/1/2008	120.61	122.1	2796.711	53.9	54.8	2791.952	104.07	104.6	2810.97	8.21	28.3	2784.49
10/30/2008	119.17	122.1	2798.151	53.87	54.8	2791.982	103.91	104.6	2811.13	8.18	28.3	2784.52
10/2/2008	117.9	122.1	2799.421	53.94	54.8	2791.912	104.6	104.6	2810.44	8.09	28.3	2784.61
8/8/2008	115.78	122.1	2801.541	53.12	54.8	2792.732	101.1	104.6	2813.94	6.97	28.3	2785.73
7/3/2008	105.4	122.1	2811.921	49.73	54.8	2796.122	97.49	104.6	2817.55	4.65	28.3	2788.05
6/3/2008	87.52	122.1	2829.801	48.36	54.8	2797.492	90.71	104.6	2824.33	2.93	28.3	2789.77
5/20/2008	90.49	122.1	2826.831	48.17	54.8	2797.682	88	104.6	2827.04	2.67	28.3	2790.03
5/16/2008	91.34	122.1	2825.981	46.45	54.8	2799.402	88.4	104.6	2826.64	3.88	28.3	2788.82
4/23/2008	114.42	122.1	2802.901	50.16	54.8	2795.692	101.1	104.6	2813.94	7.6	28.3	2785.10
3/10/2008	119.65	122.1	2797.671	51.47	54.8	2794.382	103.53	104.6	2811.51	8.4	28.3	2784.30
2/7/2008	120.1	122.1	2797.221	51.2	54.8	2794.652	103.8	104.6	2811.24	8.55	28.3	2784.15
12/26/2007	120.34	122.1	2796.981	51.52	54.8	2794.332	103.98	104.6	2811.06	8.52	28.3	2784.18
11/9/2007	121.3	122.1	2796.021	51.65	54.8	2794.202	104	104.6	2811.04	8.75	28.3	2783.95
9/27/2007	119.12	122.1	2798.201	51.75	54.8	2794.102	103.12	104.6	2811.92	7.22	28.3	2785.48
5/8/2007	107.64	122.1	2809.681	49.57	54.8	2796.282	96.18	104.6	2818.86	5.22	28.3	2787.48
11/14/2006	119.21	122.1	2798.111	51.88	54.8	2793.972	102.72	104.6	2812.32	7.96	28.3	2784.74
10/30/2006	119.48	122.1	2797.841	51.82	54.8	2794.032	103.69	104.6	2811.35	7.92	28.3	2784.78
8/16/2006	119.39	122.1	2797.931	51.72	54.8	2794.132	103.51	104.6	2811.53	7.72	28.3	2784.98
7/28/2006	119.14	122.1	2798.181	51.61	54.8	2794.242	103.32	104.6	2811.72	7.42	28.3	2785.28
6/21/2006	110.89	122.1	2806.431	51.23	54.8	2794.622	101.62	104.6	2813.42	6.18	28.3	2786.52
5/27/2006	109.78	122.1	2807.541	50.76	54.8	2795.092	98.92	104.6	2816.12	4.98	28.3	2787.72
4/7/2006	114.34	122.1	2802.981	51.14	54.8	2794.712	99.79	104.6	2815.25	4.96	28.3	2787.74
3/12/2006	119.52	122.1	2797.801	51.62	54.8	2794.232	103.39	104.6	2811.65	6.18	28.3	2786.52
2/24/2006	119.44	122.1	2797.881	51.95	54.8	2793.902	103.79	104.6	2811.25	7.92	28.3	2784.78
10/27/2005	119.41	122.1	2797.911	51.94	54.8	2793.912	103.76	104.6	2811.28	7.81	28.3	2784.89
9/10/2005	119.32	122.1	2798.001	51.84	54.8	2794.012	103.66	104.6	2811.38	7.76	28.3	2784.94
8/27/2005	119.3	122.1	2798.021	51.78	54.8	2794.072	103.14	104.6	2811.9	7.68	28.3	2785.02

Piezometer Num P2 Elev.				PM1 Elev.			PM2 Elev.			A8 Elev.		
G.S.= 2917.321				G.S.= 2845.852			2915.04			G.S.= 2792.7		
Date	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev	DW	TD	WS Elev
7/14/2005	119.22	122.1	2798.101	51.74	54.8	2794.112	103.46	104.6	2811.58	7.28	28.3	2785.42
6/24/2005	112.79	122.1	2804.531	51.68	54.8	2794.172	103.29	104.6	2811.75	6.22	28.3	2786.48
5/29/2005	119.42	122.1	2797.901	50.92	54.8	2794.932	103.01	104.6	2812.03	5.91	28.3	2786.79
4/10/2005	119.7	122.1	2797.621	51.72	54.8	2794.132	103.32	104.6	2811.72	5.42	28.3	2787.28
3/19/2005	119.82	122.1	2797.501	51.82	54.8	2794.032	103.49	104.6	2811.55	7.79	28.3	2784.91
2/13/2005	119.86	122.1	2797.481	51.87	54.8	2793.982	103.54	104.6	2811.5	7.86	28.3	2784.84
11/19/2004	119.9	122.1	2797.421	51.91	54.8	2793.942	103.59	104.6	2811.45	7.96	28.3	2784.74
10/17/2004	119.89	122.1	2797.431	51.84	54.8	2794.012	103.52	104.6	2811.52	7.91	28.3	2784.79
9/24/2004	119.91	122.1	2797.411	51.81	54.8	2794.042	103.49	104.6	2811.55	7.82	28.3	2784.88
8/17/2004	119.84	122.1	2797.481	51.79	54.8	2794.082	103.34	104.6	2811.7	7.79	28.3	2784.91
7/22/2004	119.21	122.1	2798.111	51.72	54.8	2794.132	103.29	104.6	2811.75	7.42	28.3	2785.28
6/18/2004	116.8	122.1	2800.521	50.69	54.8	2795.162	102.14	104.6	2812.9	7.01	28.3	2785.69
5/25/2004	115.14	122.1	2802.181	50.95	54.8	2794.902	101.34	104.6	2813.7	6.55	28.3	2786.15
3/19/2004	119.74	122.1	2797.581	51.68	54.8	2794.172	101.46	104.6	2813.58	7.8	28.3	2784.90
2/12/2004	119.45	122.1	2797.871	51.82	54.8	2794.032	103.52	104.6	2811.52	7.8	28.3	2784.90
12/10/2003	119.44	122.1	2797.881	51.86	54.8	2793.992	103.54	104.6	2811.5	7.91	28.3	2784.79
11/19/2003	119.72	122.1	2797.601	51.84	54.8	2794.012	103.59	104.6	2811.45	7.9	28.3	2784.80
10/21/2003	119.32	122.1	2798.001	51.84	54.8	2794.012	103.54	104.6	2811.5	7.94	28.3	2784.78
9/23/2003	119.51	122.1	2797.811	51.76	54.8	2794.092	103.49	104.6	2811.55	7.7	28.3	2785.00
8/26/2003	119.42	122.1	2797.901	51.62	54.8	2794.232	103.42	104.6	2811.62	7.68	28.3	2785.02
7/29/2003	119.16	122.1	2798.161	51.58	54.8	2794.272	103.38	104.6	2811.66	7.39	28.3	2785.31
6/14/2003	101.34	122.1	2815.981	50.62	54.8	2795.232	101.23	104.6	2813.81	6.22	28.3	2786.48
5/30/2003	103.62	122.1	2813.701	49.67	54.8	2796.182	94.67	104.6	2820.37	4.62	28.3	2788.08
4/28/2003	112.74	122.1	2804.581	50.02	54.8	2795.832	97.48	104.6	2817.56	3.41	28.3	2789.29
3/28/2003	119.62	122.1	2797.701	51.99	54.8	2793.862	102.91	104.6	2812.13	6.21	28.3	2786.49
2/24/2003	119.82	122.1	2797.501	52.74	54.8	2793.112	103.9	104.6	2811.14	7.62	28.3	2785.08
12/18/2002	119.34	122.1	2797.981	51.74	54.8	2794.112	103.36	104.6	2811.68	7.77	28.3	2784.93
9/30/2002	119.28	122.1	2798.041	51.55	54.8	2794.302	103.12	104.6	2811.92	7.22	28.3	2785.48
7/31/2002	111.72	122.1	2805.601	50.54	54.8	2795.312	98.87	104.6	2818.17	5.46	28.3	2787.24
6/28/2002	91.22	122.1	2826.101	48.82	54.8	2797.032	89.63	104.6	2825.41	2.62	28.3	2790.08

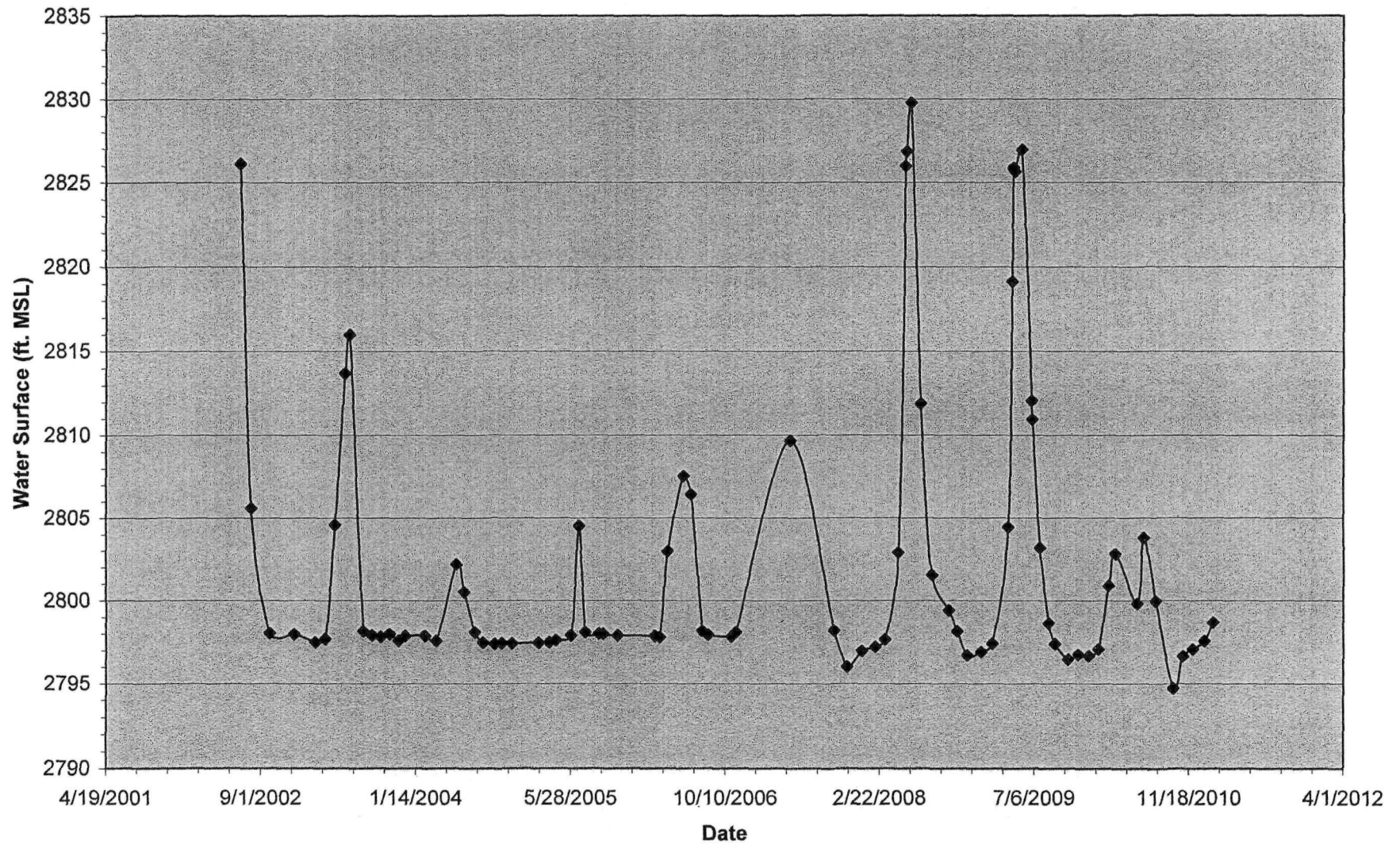
URC02 Inflows, Drain 6 Outflow and Piezometer P2



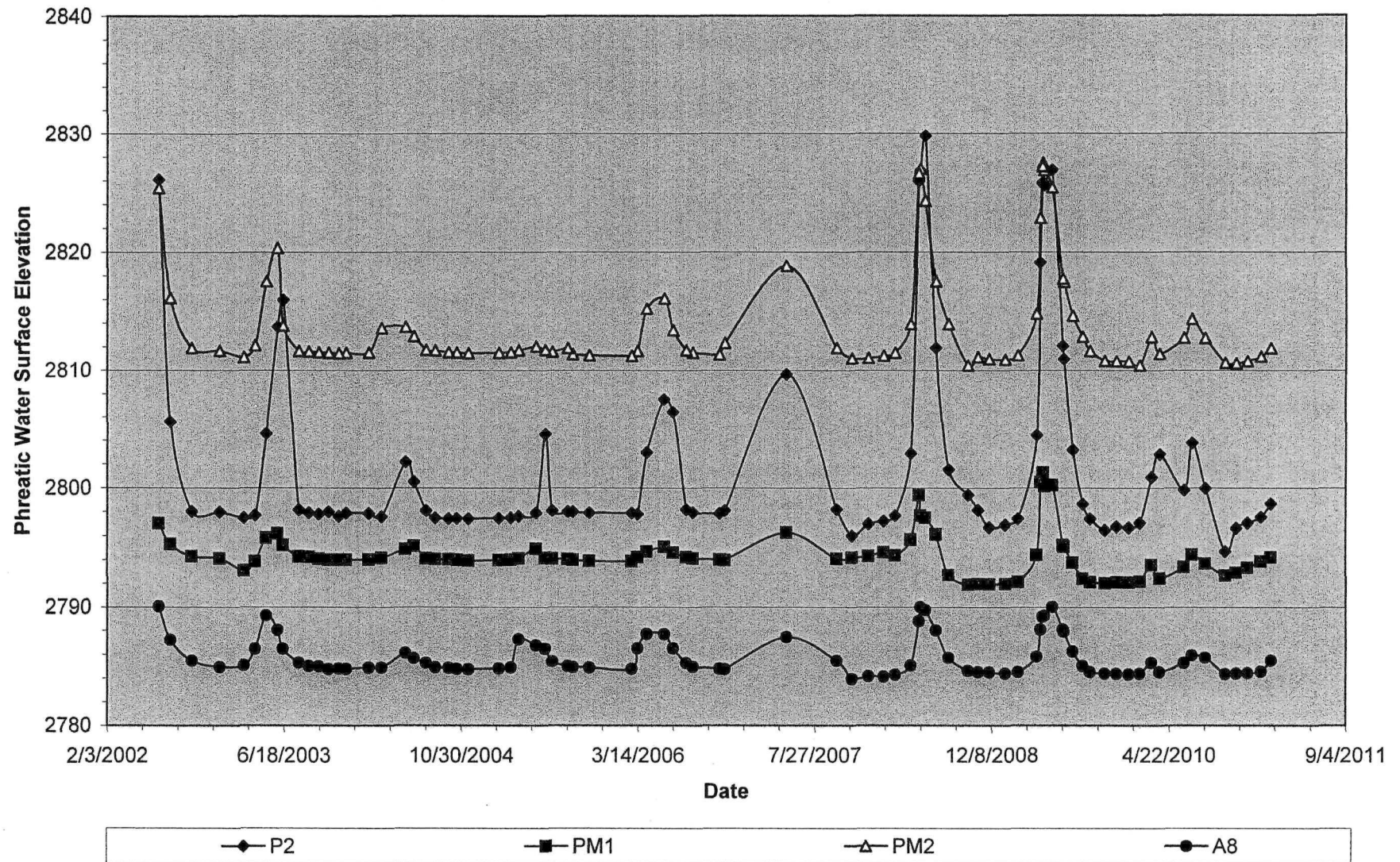
KDID Inflow at Upper Rainy Creek and Drian 6 Comparision



KDID Piezometer P2



KDID Piezometers July 1, 2002 to February 04, 2011



KDID All "Wet" Piezometer Elevations 2008 - 2011

